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THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

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Status of Treated Tooth—*Skillen*

Syphilitic Lesions of Mouth—*O'Leary*

Gold Inlays—*Tinker*

Blood Counts in Dental Infections—*Harvey-LaFavre-Heselton*

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"Stomatology or Dentistry"

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SHEPPARD WALTER FOSTER, D.D.S., F.A.C.D., Atlanta, Ga.
President of the American Dental Association
Guest of honor at the Mid-Winter Clinic of the Chicago Dental Society,
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Original Communications

THE STATUS OF THE TREATED TOOTH

By WILLIAM G. SKILLEN, D.D.S., Chicago, Illinois

THIS report is based upon an examination of about 500 treated teeth, of which about half were negative roentgenographically. As indicated in a previous report[1] of which this study is a continuation, these teeth were collected from a number of sources, chiefly for the purpose of obtaining examples as near the average in character as possible. In doing so, the collecting of histories was made impossible in many instances, so that this feature, at present, is not very valuable. Conditions also have been so widely variable that little attempt may be made to correlate findings numerically or structurally. The work from the start was of a rather tentative nature, principally to aid in mapping out future programs, some of which are now being carried out. The study, however, has indicated some things of interest and, it is believed, of importance.

The first and outstanding feature to be observed in the sections of these teeth which were prepared is the character of the technic employed in treating the pulps; second, the character of the pulp remnant and its probable relation to absorption and calcification within the pulp canals and, third, the stationary character and persistance of pulp tissue under such unfavorable conditions.

CHARACTER OF TREATMENT

One hundred and seventeen teeth or roots were judged, upon the basis of the roentgenograms, to represent fairly good treatments, or at least, fairly good root fillings. These, on histologic examination of the sections prepared of them, dwindled to about twenty-one

1. Skillen, W. G.: Hard Tissue Changes, 11: 350 (April) 1924.

fair examples and three or four good examples of pulp treatment or root-canal filling.

To simplify matters, multirooted teeth, molars and first bicuspids were separated into their component parts and these parts judged separately. This was done to enable us to get a line on the molars especially, as it was almost impossible to find an upper molar that taken as a whole could be rated as representing a good treatment. Frequently, the lingual roots of such teeth could be so rated, but usually the buccal roots were filled poorly or not at all. The same thing applies to a certain extent to lower molars and upper first bicuspids; and, on account of this method of handling the situation, these are listed as roots. The poorly treated bicuspids and molars, then, consist of, chiefly, first bicuspid roots and buccal roots of upper molars. Only two of the latter were found that could be considered in any way successful treatments roentgenographically, and these were eliminated in the histologic examination. The accompanying table gives the types of teeth or roots that compose the negative group mentioned above, and indicates how these became eliminated on examination.

Histologic examination showed that, in general, much, if not practically all, of the pulp had been left in the canals. (Figs. 1-7, 9, 11, 17 and 18.) This was the most common condition found. In others, apparently all kinds of débris were added to the pulp remnant or root fillings. (Figs. 5 and 16.) In others, there was an indescribable mixture of what appeared to be clotted blood, pulp shreds, débris and various kinds of root-filling material.

The accessibility of many of these canals might, of course, be questioned. But as regards central incisors, cuspids and the lingual roots of upper molars, or such examples as teeth with incompletely formed roots (Fig. 7), this factor cannot be readily granted. Fair consideration was given this question and, after some study, eighty-eight of the 117 alone were pronounced accessible. Furthermore, it was usually found that, even when the pulp tissue

DISTRIBUTION OF 250 ROENTGENOGRAPHICALLY NEGATIVE TEETH OR ROOTS

Type of Tooth or Root	Number Negative	Treatment Roentgenographically		Treatment Histologically		
		Poor	Good	Poor	Fair	Good
Central incisors	34	24	10	6	2	2
Lateral incisors	39	26	13	8	4	1
Cuspids	8	7	6	5	1	
Bicuspid roots	72	29	38	30	7	1
Molar roots	97	47	50*	43	7	
Total	250	133	117	92	21	4

*Two buccal roots of upper molars.

was not removed, one or more gutta-percha cones had been inserted into the canal and the tissue which it contained (Figs. 1, 9, 11 and 13), sometimes to beyond the end of the root. (Figs. 2, 7 and 17.)

It would seem that if it were possible

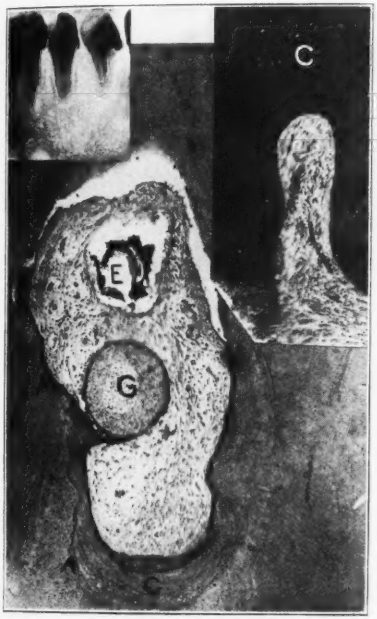

Fig. 1.—Example of poor technic; first bicuspid, roentgenographically negative; beginning fibroid (hypertrophic) degeneration of the pulp. *A*, absorption; *C*, calcification; *E*, root-filling compound; *G*, guttapercha. This tooth was treated one year.

to insert fillings such as these, it would also be quite possible to remove some of the pulp tissue.

In considering the amount of pulp tissue that formerly occupied the canals, and the size and accessibility of the latter as shown in the illustrations, note should be made of the amount of reduction that has occurred through the conversion of pulp tissue into calcified tissue. (Figs. 3, 4, 6, 9, 10 and 25, for instance.)

In addition, it is readily observed how far short of sealing the canals the gutta-percha cones have come. Not only is this true of the more apical portions of the canals: it is also true of the gingival and more accessible portions.

Fig. 2.—Example of poor technic; second bicuspid, roentgenographically negative (compare Fig. 1); beginning fibroid (hypertrophic) degeneration of the pulp. *C*, calcification; *G*, guttapercha. This tooth was treated one year.

(Fig. 16.) The haphazard and indiscriminate use of proprietary root canal adjuvants is only an additional indication of the character of the technic employed in the treatment of these teeth. It was the finding of such conditions that reduced the large number of apparently good treatments to the small number noted above.

Those that were considered poor treatments, upon the basis of the roent-

genogram, showed similar conditions. A rather large number of this group, however, showed the canals to be filled, apparently, with clotted blood as well as the misfitting filling. These do not photograph well and, therefore, are not illustrated.

There is not much need of further evidence. But, to complete the story, one or two examples of the extent to which chances are taken with the outcome of some treatments will be given. Attention is called to two cases out of the few on which any data was procurable. These two, as the roentgenograms and the sections show, are failures, in part at least. The one, an upper molar, had a history of pulpitis of some duration. In the roentgenogram, the lingual root appears to be fairly well filled, but, as a matter of fact, the sections of this root (Fig. 17) show that little or no pulp tissue had been removed, although it was supposed to have been cleaned out. The sections also show that a guttapercha cone, much too thin to fit the canal, had been inserted well up to the apex. The buccal roots were treated with mummifying paste, so that the pulp was not removed from them. These are in a suppurative condition and, apparently, the lingual root is fast following suit. In the other case, a lower molar had been treated with arsenic, the pulp re-

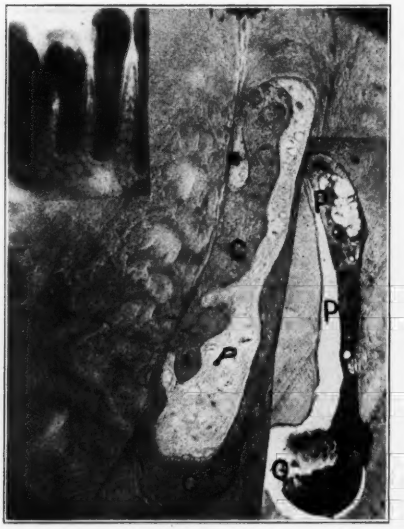

Fig. 3.—Example of poor technic; mesial root, roentgenographically negative. *P*, fibroid degeneration, both types; *C*, calcification, continuous below the filling *G*. (Compare Figure 4). This tooth was treated twelve years.

Fig. 4.—Distal root of tooth whose mesial root is shown in Figure 3. There is slight fibroid degeneration of the pulp. *C*, calcification separating pulp from *G*, guttapercha. This root was treated twelve years.

moved and the canals filled. (Figs. 19 and 20.) As a matter of fact, little of the pulp has been removed except from one canal of the distal root. Suppuration is imminent. As has been mentioned, but few of such histories, to say nothing of more complete ones, have been procurable, so that they cannot be used as evidence at the present. But the

Fig. 5.—Example of poor technic; cuspid, roentgenographically negative; *G*, termination of root filling, root filling compound and débris; *I*, inflammation of pulp. This tooth was treated ten years. (Compare Figure 6.)

question might be asked as to how many such obviously unfavorable cases are left for Nature or chance to take care of.

The twenty-one examples of what may be considered fair pulp treatment show that (Fig. 21) pulp remnants were allowed to remain here and there along the canal walls. Obviously, currettement had not been well done. The root fillings came fairly close to occluding part of the canal, possibly only being prevented from doing so by the tissue remnants that were not removed. The fillings, however, taper off too much and penetrate the pulp stump for

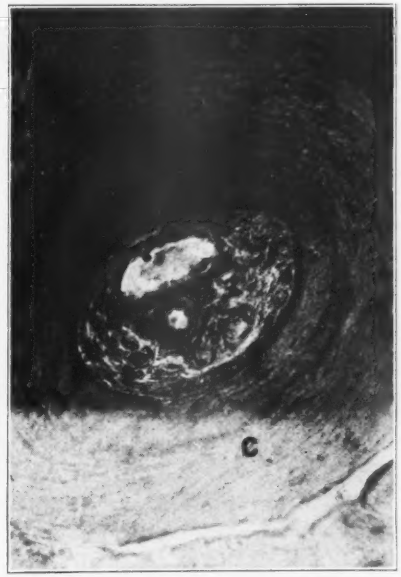

Fig. 6.—Apex of the root filling shown in Figure 5. The pulp was only slightly fibrous, with vessels enlarged. *C*, calcification.

a greater or less distance. This should not be.

Of the four good examples, one, in a central incisor, was completely cleaned out and filled to the apex with a good cohering filling. The other three were well cleaned out up to the point at which the root fillings terminated, within the apical third of the root. The

fillings did not impinge on the pulp stump, and left but few spaces between them and the canal wall. These may be considered as being all that is desired in the way of pulp treatment, other things being equal.

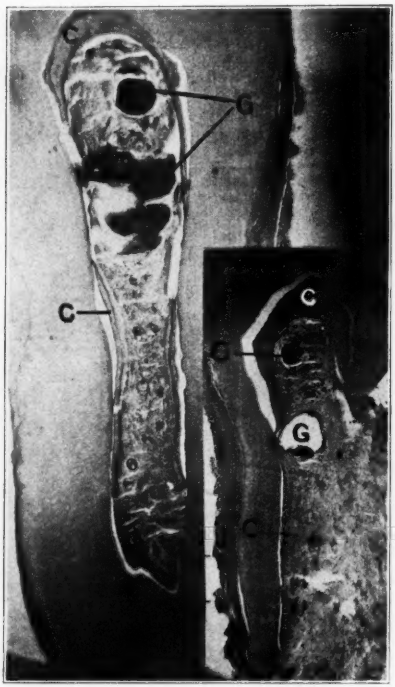

Fig. 7.—Example of poor technic; lower first molar with roots incompletely formed. The condition was similar in the two roots. There was beginning fibroid (hypertrophic) degeneration of the pulp. *C*, calcification; *G*, guttapercha extending well into the apex. This tooth was treated for about eight months.

Apparently, then, the fact that a root filling approximates the apex of the root is not proof that the tooth has been well treated. It would also appear that little or no attempt has been made either to remove the pulp tissue or to fill the canals properly. Otherwise, it must be more difficult to remove pulp tissue thoroughly from canals than is generally thought, a consideration not

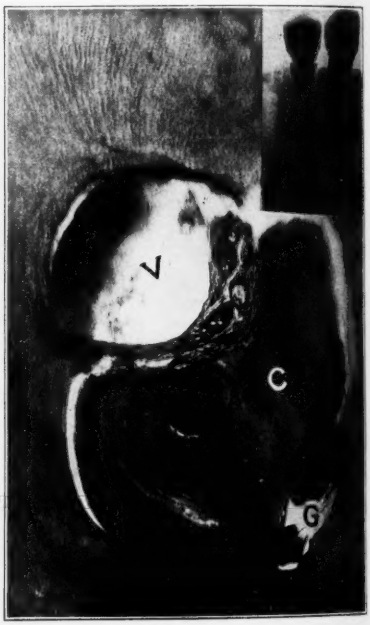

Fig. 8.—Example of poor technic; bicuspid, at termination of root fillings, *G*, roentgenographically negative. *C*, calcification which diminishes below this point leaving a fibroid (hypertrophic) degeneration with an unusually large vessel, *V*, more or less filled with blood. This tooth was treated ten years.

altogether to be disregarded. Thorough and prolonged curettement alone will insure this and enable the canals to be properly obliterated by suitable filling materials.

PULP CHANGES

Of all the teeth or roots examined, when the roentgenograms were free from pathologic shadows about the apices, only about four were devoid of some evidence of change in the pulp or pulp stumps.

Fig. 9.—Example of poor technic; bicuspid. Good example of the reduction of pulp tissue by calcification, *C*. *G*, guttapercha. There was slight fibroid (atrophic) degeneration. The tooth was treated two years. (Compare Figure 10.)

Fig. 10.—Apical end of region shown in Figure 9. There is extensive calcification (*C*) and a slight fibroid (hypertrophic) degeneration. The cells are prominent and blood vessels somewhat enlarged.

The most common condition found was that which Hopewell-Smith[2] calls fibroid degeneration. Two forms of this are seen; one, an atrophic type (Fig. 25), characterized by shrinkage or disappearance of the ground substance and many of the fibers; another, a hypertrophic type (Fig. 22), characterized by an increase both in amount and density of the fibrous element. This last form was the more common of the two. From both, in their mature state, the cells may entirely disappear.

Developmental stages and many variations and combinations of these two type forms are seen, even in the same pulp remnant. This probably depends on the nature and location of the

2. Hopewell-Smith: Pathological History, Ed. 7, Vol. 2, p. 187; Philadelphia: P. Blakistan's Son & Co.

cause of the degeneration. (Figs. 1, 3, 7 and 10.)

These conditions are not the result of infection, but are either the end results of a low grade chronic inflammation induced by irritation or are due to trophic disturbances in the pulp remains.

A no more acute inflammatory process than a mild chronic type was found, unaccompanied by roentgenographic evidence, except in such cases as Figures 5 and 6 illustrates. Here can be seen a marked round-cell infiltration of the pulp remnant adjacent to the termination of the filling material. Below this point, (Fig. 6) the pulp shows the development of a hypertrophic fibroid degeneration. What this localized indication of inflammation signifies is a question, possibly a break down. In addition to these, there were a few that no doubt would have been indicated by the roentgenogram if it had been clearer, or if the angle at which it was taken had been different. In some of these, the apical foramina were located toward the side of the root in such a position that the resulting small amount of bone shadow did not register in the film.

The cycle of the various stages of inflammatory reaction and degenerative change may be observed in the records of absorption and calcification along the wall of the pulp canal.

Fig. 11.—Example of poor technic; central incisor, roentgenographically negative; *C*, calcification; *G*, guttapercha; *H*, hyaline degeneration, not continued below filling; *P*, fibroid (hypertrophic) degeneration decreasing toward apex; *V*, enlarged vessel. This tooth was treated five years.

Fig. 12.—Example of poor technic; lateral incisor (compare Fig. 11), roentgenographically negative. *C*, calcification; *G*, guttapercha; *P*, pulp similar to that shown in Figure 11. This tooth was treated five years.

As was noted previously,[1] absorption frequently precedes calcification in the pulp canal. (Figs. 1, 9 and 10.) It would appear that certain grades of inflammation give rise to the one condition and other grades to the other condition. Probably what happens is that, with treatment, there occurs a more acute inflammation, which gives rise to every evidence of an acute inflammation, absorption usually can be seen. (Figs. 15 and 17.) In those in which suppuration has occurred, there are usually indications of a preceding absorption (Fig. 18), set in motion, no doubt, by the rise in acuteness of the inflammation that preceded suppuration.

Fig. 13.—Example of poor technic and a subsequent failure; central incisor. *G*, guttapercha; *P*, fibroid (hypertrophic) degeneration of pulp; *S*, suppuration.

absorption. This subsides, absorption ceases and calcification takes place. When the latter is found, it may be an indication that inflammation has ceased or is on the wane. In those cases (Figs. 1, 2 and 7) in which very little or no inflammation is evident, calcification is seen; while in those in which there is

Fig. 14.—Example of poor technic and a subsequent failure, sometime within ten years; bicuspid. *G*, guttapercha in one corner; *E*, proprietary root-filling compound in other surrounded by pulp shreds and débris. (Compare Figure 15.)

A good blood supply, is of course, necessary for calcification. With the development of degenerative changes in the pulp remnant, and especially in those that are due to trophic disturbances, the circulation is reduced or entirely cut off. This alone, or this in

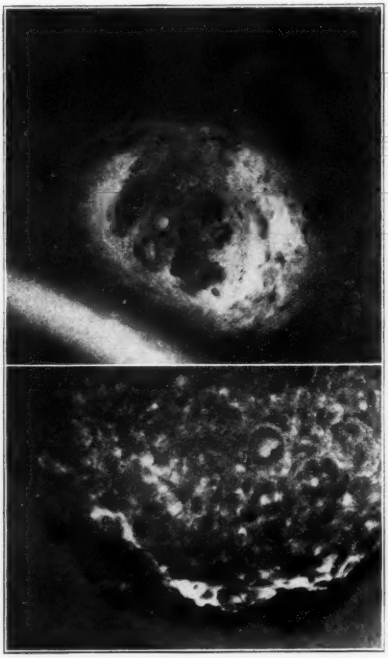

Fig. 15.—Unfilled portion of canals shown in Figure 14; upper, apparently normal; lower, in a very decided state of chronic inflammation with absorption of wall. The number and thickness of the vessel walls should be noted (endothelial proliferation).

combination with the cell atrophy that usually accompanies the change, results in a cessation of the calcifying process. This probably explains why all the pulp remnant is not converted into calcified material regardless of the time. In a few instances in which the pulp has undergone fibroid degeneration with complete atrophy of the cells, no calcification or absorption has occurred. (Figs. 13 and 22.) These conditions are, no doubt, the result of trophic disturbances pure and simple, and have set in quickly. On the other hand, there are those (Figs. 23 and 24) in which the cells of

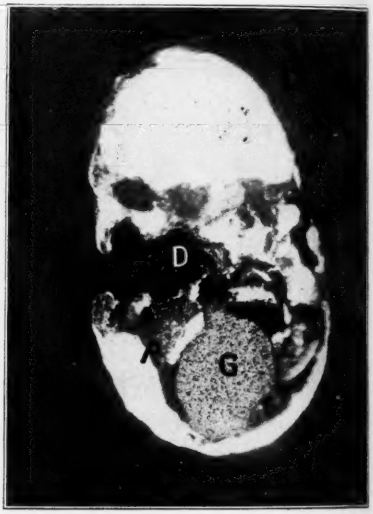

Fig. 16.—A common example of poor technic even when the canal is perfectly accessible; upper third of an upper molar lingual root. The buccal roots, of course, have not been touched. *D*, débris and root filling compound; *G*, guttapercha; *P*, pulp shreds.

the pulp remnant are apparently vital after several years but yet the tissue has not been completely calcified, although there are evidences of calcification having taken place.

Treated teeth with the pulp remnants in the condition that has been described, especially if the remnant is large and

includes practically all the pulp as so many of these do, cannot be considered in a favorable light, even if the same conditions appear to be more or less stable.

STABILITY OF CHANGES

Of the 250 cases, more or less uncertain data regarding the time they were

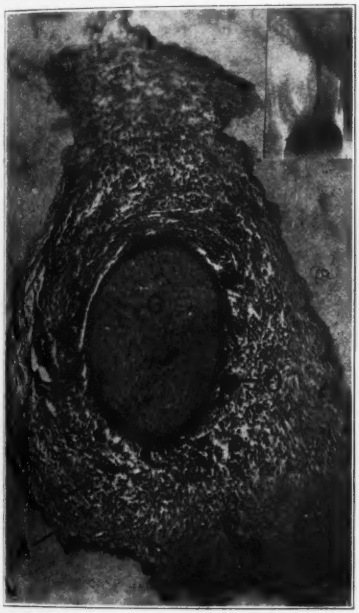

Fig. 17.—Upper molar, lingual root. The pulp was supposed to have been removed in a decided state of chronic inflammation with absorption of walls, *A*. *G*, guttapercha, surrounded by a ring of foreign body giant cells, *O*. This tooth was treated five months. (Compare Figure 18.)

treated was obtained in about 125. Twenty-eight of these had been treated from one to three years; fifty-seven ran from three to five years, and thirty-five ran up to ten years. Five specimens were obtained that were said to have been treated twelve or fourteen years previous. One each of the last three groups, and one additional on which no data was obtained, fell into the better treated

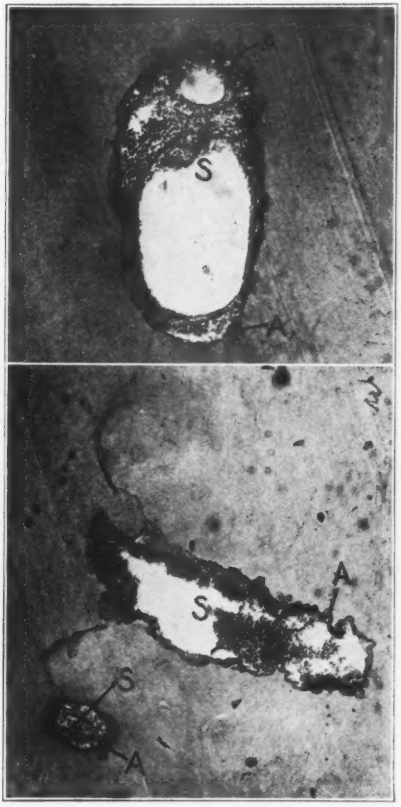

Fig. 18.—Upper molar, buccal roots. Suppuration after treatment with mummifying paste.

group, and the pulps appeared to be normal. All the others, as has been mentioned, showed some sort of change. That such pulps as these have existed for periods of ten or more years without further and worse changes taking place

would indicate the stability of these changes and even the resistance of pulp tissue under adverse conditions. It is

Fig. 19.—Mesial canals. A failure resulted somewhere within a ten-year period, after treatment with arsenic. The pulp is in a state of chronic inflammation, with necrosis of hard tissue at the apex. (Compare Figure 20.)

further indicated by the many instances (Figs. 15 and 20) in which a part of the pulp, in one or more canals, remains in the condition above described or practically normal, while that part in another canal or canals is undergoing suppuration. There is no means, of course, of telling how long such conditions as the last will continue, but that they do for awhile is evident.

There is every indication and but little doubt that, in spite of this appearance of durability, subsequent failures

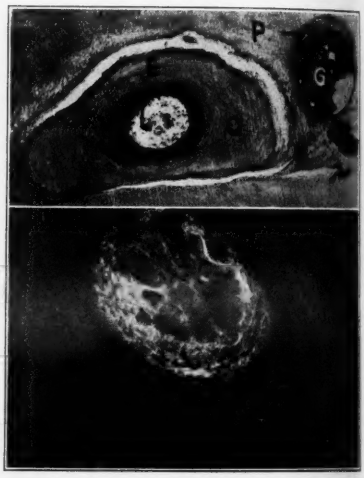

Fig. 20.—Distal canals of tooth shown in Figure 19; both partially filled, one more than the other. The pulp is apparently normal. *C*, calcification; *E*, root-filling compound; *G*, guttapercha; *P*, pulp shred.

do occur in pulp remnants that have undergone some of these changes. If the process of suppuration has not entirely masked the original contents of the canals in those cases that have failed, often tissue of the same character as that described may be seen. This indicates that some time had elapsed before suppuration set in and that, in that time, the pulp remnant had undergone these fibroid changes. (Fig. 13.) Only

twenty-eight such cases have been observed, too small a number to do more than merely indicate what probably occurs.

Whether these subsequent failures, which they appear to be, are the result of a flaring up of a dormant infection within the pulp remnant or canal, or of the entrance of bacteria from without, is a question, no bacterial studies having been made.

There is no doubt that many of these pulps were in a favorable condition in the beginning. Obviously, success in these cases, as far as it goes, has not been due to the treatment, but has resulted in spite of it. All in all, the indication is that pulp tissue is not the susceptible thing it is thought to be; and one wonders why a reasonably safe pulpcapping operation cannot be carried out.

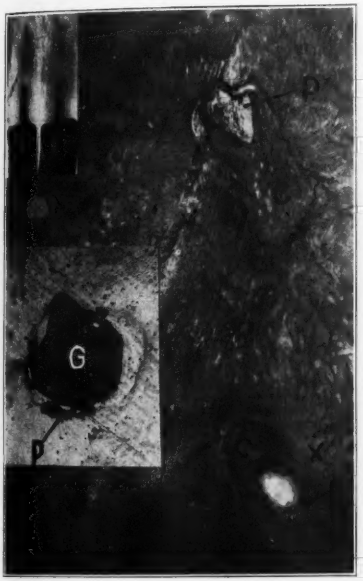

Fig. 21.—Lateral incisor, roentgenographically negative; fairly good technic. *X*, accessory canals. The pulp is practically normal. Shreds of pulp were left between *G*, guttapercha, and *P*, the wall. This tooth had been treated five years.

Fig. 22.—Central incisor; canal well cleaned up to point filled; fibroid (hypertrophic) degeneration of pulp with complete cell atrophy; no calcification.

CONCLUSIONS

If these cases can be taken as fair examples of the average treated tooth, then it is perfectly clear that the burden of failure does not rest on the tooth alone. Rickert[3] appears to have come to the same conclusion from a study of similar conditions.

3. Rickert, U. G.: Dent. Cosmos, 67: 635 (July) 1925.

Fig. 23.—Bicuspid; excellent treatment, after ten years. The pulp is surrounded by some calcification, *C*, and is normal.

Fig. 24.—Lateral incisor; excellent treatment, after fourteen years. Pulp similar to that in Figure 23. *C*, calcification.

Two things seem evident: proper pulp treatment cannot be carried out by the average person; or the prevailing idea of the day that it is a useless procedure to carry out is affecting whatever ability a man may have, so that the job is not being done properly.

It can be assumed, all things being equal, that if cases such as those described here can be successful, consider-

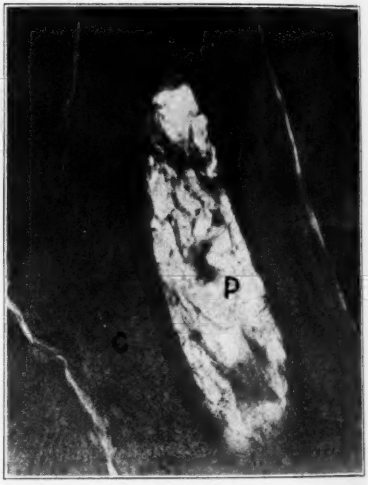

Fig. 25.—Fibroid degeneration, atrophic type. The cells have entirely disappeared. Amount of calcification may be noted at *C*.

able hope can be held out for those properly treated.

A part of this proper treatment consists in the reduction of the pulp tissue to the smallest amount possible without too great injury. Thorough and prolonged curettement alone will accomplish this. Also, the filling material should not impinge on the pulp stump.

SYPHILITIC LESIONS OF THE MOUTH

By PAUL A. O'LEARY, M.D., Rochester, Minnesota

(Read before the American Dental Association, Louisville, Ky., September 22, 1925)

SYPHILIS, a most protean disease, may produce such a variety of signs and symptoms that it is possible to mention only a few of its characteristics in a paper of this sort. It is important that the dentist be informed regarding the manifestations of syphilis of the mucous membrane in order that he may (1) recognize and know the signs of the disease in the oral cavity and refer the patient to a physician for treatment, and (2) safeguard himself, his office assistants, and perhaps his family, against an infection. It should be borne in mind that many patients who have syphilis are not aware of the presence of the oral lesions and are often honestly ignorant of the fact that they have syphilis. It is unfortunate that many have been led to believe that syphilis is always the wage of immorality, since it may be acquired by direct contact with a patient who has the lesions of the infectious period of the disease, and that this contact need not be sexual. The mucous membranes of the mouth as well as the genitalia are common sites for infectious lesions.

Syphilis is due to an organism, *Spirochaeta pallida*, described by Schaudinn in 1905. That syphilis is the outgrowth of chronic gonorrhea has been a popular misconception since the time of Hunter, but the organism is not related to the gonococcus. *Spirochaeta pallida* may be successfully inoculated through unabraded skin, contrary to the belief that a wound or scratch is necessary as the portal of entry for the organism. In approximately five or six weeks after the successful implantation of *Spirochaeta pallida* in the skin or mucous membrane, a chancre (the initial lesion of syphilis) makes its appearance. This may be the first cutaneous sign of syphilis, although by the time the chancre is developed, the syphilitic virus has migrated to the neighboring lymph nodes, and the spirochetes begin to appear in the blood. This explains the futility of excising a chancre with the hope of preventing diffusion of the disease. In fact, it has been suggested that excision of the chancre may lead to a more rapid spread of the infection throughout the body, as the primary lesion is, in a measure, evidence of the fight the body is making against the spirochete.

It is essential to emphasize the fact that the characteristics of a chancre are not constant. We occasionally observe the classic hunterian chancre, although the lesions may vary from a simple scratch to a large, indurated ulcer. Because of the variety of clinical pictures of the primary lesion of syphilis, it is impossible to attempt to describe each in detail. The extragenital chancre is bizarre in its characteristics, and, as it is

particularly this type of chancre that I wish to bring to your attention, I believe a detailed description of the concomitant signs and symptoms of a chancre will be more instructive than a detailed discussion of the variable primary lesion.

The lip is the most common site for extragenital chancres, although the tongue, gums, tonsils, cheek, neck, eyelid and chin are not uncommon situations (Fig. 1).

Fig. 1.—Chancre of the lip.

A bubo, or swelling of the lymph nodes adjacent to the chancre, is the most valuable of the associated signs. A syphilitic bubo is not painful, is not attended with local signs of infection, such as redness and heat, and is not, as a rule, of much concern to the patient. Quite in contrast to the adenopathy of cancer, the bubo of syphilis follows rapidly the appearance of the chancre. The individual nodes, which are frequently several centimeters in diameter (Fig. 2), may be single or multiple, and, if more than one is present, they appear in chains or pleiades. The syphilitic bubo as a rule does not suppurate. Cordlike inflamed lymph channels may connect the chancre and the bubo. In contrast, the adenopathy of cancer of the lip is slow in its development, and the lymph nodes are small, of stony hardness, and at times difficult to find. They are usually associated with a lesion of the lip of long standing.

The chancre of the lip may appear as a firm, hard protruding nodule, with marked induration or thickening around

Fig. 2.—Chancre of the lip and submaxillary bubo.

and beneath the growth. A varying degree of ulceration with crusts and erosion of the surface is present. The hardness or induration is less marked than in cancer of the lip. The size of the lesion is not of diagnostic significance. *Spirochaeta pallida* may be recognized from scrapings from the chancre and from the bubo, by aspirating material from the lymph node and examining it under a dark-field illuminator. In approximately 90 per cent of all types of chancre, *Spirochaeta pallida* may be recognized with the aid of the dark-field illuminator; hence, it is nec-

essary to have all suspected chancres examined in this manner, and by an expert. This is especially true of the extragenital lesion, since its bizarre appearance and the insignificant associated signs are often not sufficient for a clinical diagnosis. As cancer of the lip has been observed in young adults and likewise chancre of the lip in patients well advanced in the cancer age, the age factor in the differential diagnosis is not always of value.

Chancre of the tongue is considerably less common than chancre of the lip, but it is, as a rule, associated with the same type of bubo. Chancre of the eyelid and of the cheek, the result of abrasion and cuts from barbers' instruments, are not uncommon. Neither is chancre of the gum rare.

Fig. 3.—Chancre of the finger.

Chancre of the finger has been seen frequently enough in dentists to warrant special mention. It is often found on the ring finger of the left hand of dentists who use that finger to retract the cheek (Fig. 3). Chancre of the finger is characterized, as are other extragenital lesions, by the unclassic appearance, although it is associated with a bubo at either the elbow or the armpit. The cordlike lymph channels between the chancre and the bubo may be demonstrable. The primary sore of syphilis is painless and causes only slight local discomfort. This is quite in contrast to a felon or pus infection around the nail, which is usually the first diagnosis given for chancre of the finger tip. In contrast to the chancre on the genitalia, the extragenital chancre may be warty or cauliflower-like. It is indolent in its course and does not respond to the local therapeutic measures usually applied to infected fingers. Incision of the mass or drilling of the finger nail is not followed by the escape of pus.

Fig. 4.—Mucous patch on the right side of the lower lip.

From three weeks to three months after the appearance of the chancre, the patient may show evidence of the constitutional symptoms of syphilis, such as sore throat, malaise, headache, loss in weight, fever, gastro-intestinal symptoms, bone pains and complaints referable to the special senses. These symptoms are evidence of the fact that *Spirochaeta pallida* has been dissemi-

nated throughout the body by way of the blood and lymph streams. The patient is now in the second stage of the disease. The terms primary, secondary and tertiary stages of syphilis are used merely for convenience, it being impossible to distinguish the various phases of the disease in all patients. The stages frequently overlap and intermingle so that

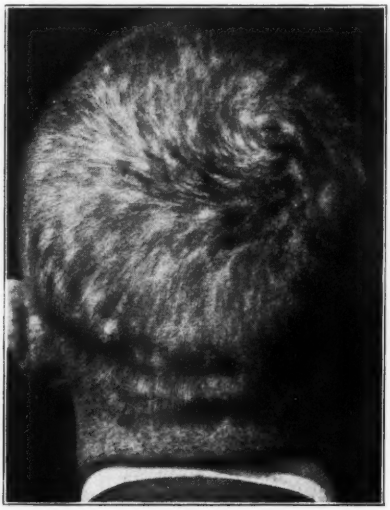

Fig. 5.—Extensive syphilitic alopecia of the scalp.

it is more satisfactory to speak of the infectious and noninfectious periods rather than of the primary, secondary and tertiary stages. Besides the constitutional symptoms, a rash or eruption on the body, superficial ulcerating lesions of the mouth and about the genitalia, alopecia and symptoms denoting involvement of the central nervous system are frequent at this time.

The lesions of secondary syphilis on the mucous membrane of the mouth are called mucous patches (Fig. 4). A mucous patch is a syphilitic papule which has become eroded, broken down and finally ulcerated. As the result of this superficial ulceration, a round or oval patch with a gray exudate develops. The mucous patch, which may be found in any part of the mucous membrane of the mouth, may be single or may involve the entire area. These lesions are highly infectious and *Spirochaeta pallida* may readily be obtained from them by dark-field examination of the scrapings. Besides the generalized eruption, alopecia of the scalp and eyebrows may be of diagnostic help.

Fig. 6.—Syphilitic alopecia of the eyebrows.

Alopecia of the scalp is frequently found around the occiput or nape, and is of a moth-eaten or patchy type (Fig. 5). It is characterized, not by a total loss of hair, but by a spotty falling of the hair, often unrecognized by the patient. Alopecia of the eyebrows is more rare than alopecia of the scalp, and it is usually overlooked, although investigation may readily be made without inconvenience to the patient (Fig. 6).

The two diseases whose lesions resemble the mucous patches of syphilis are erythema multiforme and aphthous stomatitis. The former is usually associated with multiform lesions of the hands and feet. The lesions are

more ulcerative and more painful than the mucous patches. On the other hand, aphthous stomatitis differs from the mucous patch of syphilis in that the areola or erythematous area about the aphthous patch is pronounced, and the lesions are painful, transitory and associated with a history of frequent recurrence. As the palms and the soles are frequently the sites of syphilitic lesions, the presence of lesions on the extremities may be confusing as a differential diagnostic point. Blisters or vesicles are the exception in syphilitic lesions, being sufficiently rare to warrant the exclusion of syphilis when they are present.

The constitutional symptoms of the disease may, like the cutaneous findings of secondary syphilis, be mild or severe. Frequently, patients who are in the infectious period of the disease have no knowledge of the presence of the lesions, because of the mild character of the symptoms.

There are a group of patients giving a history of having had secondary lesions months or years previously who, when examined, present signs of the infectious phase of the disease. To these lesions, the term recurrent secondaries is applied. They are evidence of the patient's lack of resistance to *Spirochaeta pallida*, frequently the result of inadequate or poorly managed treatment. The recurrent lesion is highly infectious and presents a serious problem from the standpoint of public health. It is characteristic of syphilis that the older the infection, the greater the tendency for *Spirochaeta pallida* to become localized in various organs or tissues of the body, the possibility of transmitting the infection to others being thus decreased. However, the patients who remain in this transitory period between the phase of dissemination and the phase of localization of *Spirochaeta pallida* continue indefinitely as potential transmitters or carriers of the disease. Fortunately, such patients are not numerous. The lesions of the mucous membrane, as recognized in this recurrent type, present the same appearance as the lesions of secondary syphilis, differing essentially in that they are not so numerous and are less significant to the patient.

The Wassermann test may be of no diagnostic value in the early phases of the disease. It has been shown that in the first two or three weeks of the chancre stage, the Wassermann reaction may be negative, and such a report may be misleading as an aid to diagnosis of a suspicious extragenital chancre. As the dark-field examination, if made by an expert, is positive in 90 per cent of the chancre fluids examined, this seems a more valuable test than the Wassermann blood test in this period of the disease. As the secondary manifestations of the disease become prominent, and as the organisms become disseminated throughout the body, the percentage of positive Wassermann reactions becomes higher, until, at the period of complete generalization of the organisms, practically 100 per cent of the patients have a positive Wasserman reaction. Thus, the Wassermann test may be of little value as an aid in the diagnosis of a chancre, but authentic when the secondary lesions are present.

I have purposely omitted from this discussion the cutaneous manifestations of syphilis during the secondary period. The lesions are so variable that their description in this paper is not warranted. The cutaneous lesions of late syphilis, which appear from one to fifty years after the appearance of the

chancre, are seen around the mouth frequently enough to warrant a short discussion. The lesions of this stage are considered noninfectious, but a diligent and protracted search from the border of a late syphilid might demonstrate an occasional *Spirochaeta pallida.* This is so rare that it is necessary to adopt only moderate prophylactic measures in handling the lesions. The cutaneous lesions of long-standing syphilis are important because they may be diagnosed without the aid of laboratory tests. The late lesions of the mucous membrane are also diagnostic and may undergo malignant changes.

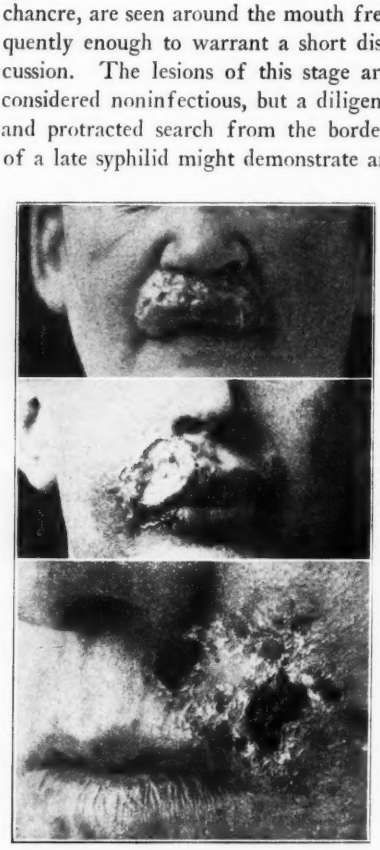

Fig. 7.—Three types of late syphilid of the lip.

The term gumma has been applied to the tumors which develop as a late manifestation of the disease, the combined result of the defensive measures of the tissue and the action of *Spirochaeta pallida.* A gumma may be minute or large enough to involve the entire cheek or half of the back, and may be single or multiple. The characteristics of the solitary or multiple cutaneous lesions of late syphilis are:

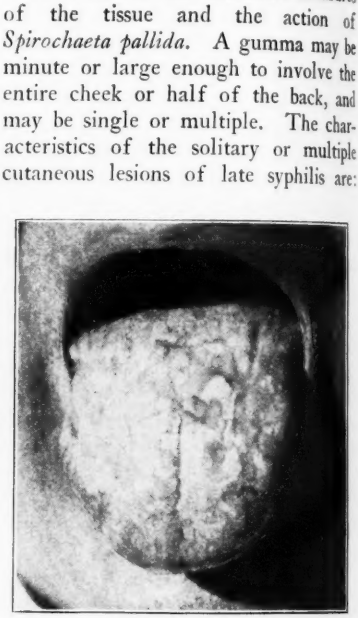

Fig. 8.—Syphilitic leukoplakia of the tongue.

induration or hardness of border; archiform or kidney-shaped contour; tendency to central healing and peripheral extension; residual pigmentation in the scar; superficial or deep and destructive atrophy and scarring, and unilateral distribution (Fig. 7). All of the late syphilitic lesions do not ulcerate. It is for this reason that the induration, or the sensation of hardness and deep infiltration elicited by gentle palpation of the lesion, is of such diagnostic importance.

In the mouth, the late lesions are essentially of three types: (1) the so-

called leukokeratosis; (2) gummatous infiltration in the mucous membrane or the tongue, and (3) destructive osseous lesions of the hard palate or jaw. Syphilitic leukoplakia is always associated with atrophic glossitis or the absence of the papillae on the tip of the tongue (Fig. 8). It is frequently found in the commissures of the mouth and on the tongue and cheeks, and is somewhat bluish and striated. This is in contrast to the traumatic leukoplakia,

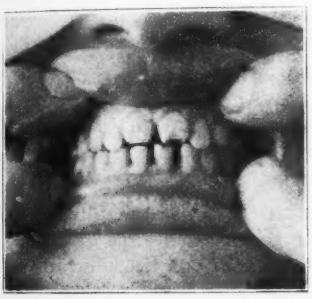

Fig. 9.—Hutchinsonian teeth of congenital syphilis, showing the characteristics in the central incisors.

which is usually somewhat diffuse gray, and not striated. Leukoplakia is of particular interest because it frequently is the forerunner of malignant changes. It is necessary not only to treat the syphilis to minimize the development of new areas of leukoplakia, but also to treat the leukoplakia by diathermy or cautery to prevent the development of cancer.

Gumma of the tongue is not rare, and fortunately is usually associated with atrophic glossitis and patches of leukoplakia. The lesions of cancer and tuberculosis of the tongue resemble gumma of the tongue.

It is necessary only to mention gumma of the nasal septum with its resultant perforation of the hard palate and characteristic nasal deformity due to destruction of the bridge of the nose, a clinical picture often recognized by the laity.

Gummatous infiltration of the alveolar process of the jaw may be recognized with the aid of the roentgen ray. In my experience, such lesions have been noted as a result of the trauma following extractions, and also as a result of extractions in a jaw already showing syphilitic bony changes. Trauma plays a prominent part in the production of the late signs of the disease, such as gumma of the skin or syphilis of the bones.

In tabes dorsalis, or locomotor ataxia, which is the result of syphilitic disease in the spinal cord, changes occur in the bones so that, after even slight injury, pathologic fracture may occur. Operative procedures should be undertaken with great care in such patients, because, if the jaw is fractured, there is great difficulty in obtaining union of the bones. An ununited fracture in this situation is cause for great distress to the operator and the patient.

Little has been written about the effect of acquired syphilis on the teeth. The patient who has gingivitis, when treated with mercury by any of the many methods of administration, is prone to develop stomatitis, which, with its serious sequelae, has been misconstrued as an effect of the disease rather than of the remedy. It is to be noted that syphilitic disease of the jaw or surrounding tissue may result in injury to or loss of the teeth.

CONGENITAL SYPHILIS

In discussing the stigmata of congenital syphilis in the child, in reference to dentistry, it is necessary to confine the remarks to the late or retarded type of the disease. The manifestations of syphilis in the newborn will be omitted. The child who develops syphilis prenatally, or who acquires it while in the birth canal, passes through the various periods of syphilis which have been previously mentioned. If the infection is not severe enough to overwhelm the infant, or if, with the aid of treatment, the patient passes through the infectious periods of the disease, characteristic changes develop in the bony structures which alone warrant the diagnosis of congenital syphilis. These structural alterations are called stigmata. It is to be borne in mind that the child born of healthy parents may acquire the infection by extragenital inoculation, and the disease run a course similar to that of syphilis in the adult.

There are three groups of symptoms, any one of which has a bearing on the diagnosis of congenital syphilis. When these three manifestations: hutchinsonian teeth, interstitial keratitis, and nerve deafness, are present in the patient, they comprise the "hutchinsonian triad." It is infrequent to find the three signs of the disease present at the same time, but one alone or a combination of any two is not uncommon.

It is bringing coals to Newcastle to discuss hutchinsonian teeth in a paper of this type. Nevertheless, there seems to be considerable confusion as to the classic characteristics of such teeth. The deciduous teeth are of no diagnostic value in congenital syphilis, but in the incisors of the permanent set pathognomonic signs of the disease may be present. The molars may also show characteristic changes. The essential alterations in the incisors are the pegging or screwdriver shape, anteroposterior thickening, notching or grooving, and spacing of the teeth (Fig. 9). The first two alterations mentioned are of the most value diagnostically; whereas, the grooving and notching may be the result of any constitutional disturbance during the first year of life. It is unfortunate that so much significance has been attributed to the least important of the characteristics of this type of tooth. The degree of the involvement of the teeth is not an index of the severity of the infection. Unilateral hutchinsonian teeth have been observed.

The molars may also show malformations, characteristic of the disease. The presence of the mulberry molar, or moon tooth, has not the diagnostic significance of the hutchinsonian tooth, although it is frequently of material aid in confirming a diagnosis of congenital syphilis. The recent work of Karshner and Cole[1] offers an explanation for the production of these malformations. Aplasia should suggest the possibility that syphilis is the basis for the anomaly. Stokes and Gardner[2] have reported the value of the roentgen ray in the recognition of unerupted, syphilitic incisor teeth.

Interstitial keratitis, or inflammation of the cornea, resulting later in scarring of the cornea with impaired vision, is not rare. Similarly, deafness due to

1. Karshner, C. F., and Cole, H. N.: A Study in the Teeth of Patients with Congenital Syphilis, J.A.M.A., to be published.

2. Stokes, J. H., and Gardner, B. S.: Demonstration of Unerupted Hutchinson's Teeth by the Roentgen Ray, J.A.M.A., 80: 28-29 (Jan. 6) 1923.

disease of the nerve of hearing may appear early or late in the child's life.

Gummatous disease of the hard and soft palate presents essentially the same picture in the child with congenital syphilis as is seen in acquired syphilis in the adult. The involvement of the nasal septum resulting in the characteristic deformity of the face is a valuable sign if other stigmata are present to confirm the impression. It is not to be inferred that every child with congenital syphilis has a saddle-back deformity of the nose. The overdevelopment of the frontal fosses, with the resulting prominence of the forehead, produces the so-called websterian dome, which is more frequently seen than the nasal deformity.

As a result of an inflammatory process around the mucocutaneous junctions early in the course of the disease, superficial spokelike scars are formed, which radiate from the mucous membrane out to the surface of the skin and are known as rhagades. They may be noted about the mouth, nose, eyes and anus.

The cutaneous lesions of late syphilis are not common in the child with congenital syphilis, although, when present, they show the same characteristics.

One of the unnecessary complications too often encountered in the treatment of patients with syphilis is stomatitis. Stomatitis, following treatment with mercury, is the result of a preexisting gingivitis. If the patient presents a dirty mouth, it is advisable to direct attention to the care of the mouth before antisyphilitic treatment is started and to continue prophylactic measures during the course of treatment. The removal of devitalized, apically infected and poorly crowned teeth is advisable. The presence of such foci not only predisposes to complications in the mouth, but also places an extra burden on the kidneys, liver and skin during treatment. The benefit of this form of dentistry can be noted in the improvement in the patient's general condition. Closer cooperation between the dentist and the physician in this phase of the treatment of syphilis will result in fewer complications and fewer needless interruptions in the course of the treatment.

The most common manifestations of syphilis of the mouth have been discussed, with the hope that, by the recognition of these signs, the dentist will ask for medical opinions and that adequate treatment will be instituted promptly. He may render a valuable public health service and protect not only himself but also others from a malignant infection.

DISCUSSION

William H. G. Logan, Chicago, Ill.: In Dr. O'Leary's presentation of "Syphilitic Lesions of the Mouth," which dealt particularly with the problem of early diagnosis, he stressed certain points that should be of great interest to the dental profession. He considered the diagnosis of the syphilitic patch appearing in the second stage of acquired syphilis and of aphthous ulcer, which appears very often in the mucous membrane of the mouth. These two conditions present frequently in your practice. Before Dr. O'Leary discussed the differential diagnosis, he included one very important statement which is not commonly understood or accepted, to the effect that sufficient experimental work has been done to justify the statement that syphilis is produced not only through abraded surfaces but through normal skin and normal mucous membrane. With reference to such a conclusion, I take it that he would agree that syphilis is not acquired very often through normal skin or normal mucous membrane; and why do we assume this? Because it is not often that the appearance of hard chancre is multiple. We do not doubt that many of the specific organisms are brought into contact with considerable areas of skin and mucous membrane in most cases of infection, and yet the rule is that syphilis makes its initial manifestation in

the appearance of a single hard chancre in the majority of cases. But the possibility of acquiring syphilis by the specific organisms lying on what seems to be normal skin and mucous membrane must not be overlooked because of the evidence here presented. And as Dr. O'Leary has pointed out, we should be ever mindful of the danger of infection when there is a local manifestation, be it early or late, because, even in the late stages of syphilis, there may be a return to activity, and during that period infection is liable to occur. There is less danger in the third or tertiary stage. The differential diagnosis between the syphilitic mucous patch and the apthous ulcer or canker sore can be easily determined. The syphilitic patch occurring in the mouth is, as a rule, multiple. The patient is usually unaware of the location of the involved areas in the mucous membrane of the mouth. There is little or no pain unless there is a mixed infection, and what is meant by mixed infection is this: In addition to the syphilitic involvement of the mucous patch, there is engrafted on it an acute infective process, and if this acute infective process is treated locally, the pain will subside, but the syphilitic patch will continue. So we may, in general terms, say that the patient is unacquainted with the location and number of the mucous patches occurring in the mouth. The mucous patch is gray, with a sharp line of demarcation between the healthy and diseased tissue. If one wipes the gray surface with a piece of gauze, a varnished raw meat base is usually found, and such a base is characteristic of the second stage of syphilis as it makes its manifestation in the mucous membrane. One will not find a varnished raw meat base in any other involvement of the mucous membrane as far as I am aware, and we expect to find a few telltale enlarged glands which indicate that not only possibly, but also probably, we are dealing with syphilis. Scraps from the syphilitic patch and examination under the microscope will give you a positive diagnosis. As regards diagnosis of the apthous ulcer or the canker sore: In the apthous ulcer, the patient knows the number and exact location of the involved areas. The condition is very painful. There is an increased flow of saliva and a gradual fading of demarcation from the deeply involved areas into the healthy mucous membrane. The following general facts with regard to the problem of syphilis should be kept in mind. The story of syphilis is the story of the life of the patient. It begins with infection and terminates at the death of the patient, meaning that he may have a relapse at any time, but that, under rigid treatment, the condition can be held in abeyance in most cases. After the initial infection the manifestation is local. Systemic involvement follows in the second stage, and then, during the third stage, the condition becomes more localized and the gumma manifests itself, involving either bone or soft structures. The differential diagnosis between carcinoma and gumma involving the tongue must always be kept clearly in mind. In carcinoma of the tongue, if at all extensive, in the majority of cases the tongue cannot be protruded straight forward and, if the growth is well developed will have a tendency to lie in the floor of the mouth with boardlike rigidity. The involvement as a rule is single, and pain becomes more severe as the development progresses. In gumma of the tongue, the involvement is more liable to be multiple, and the patient has greater mobility of the tongue than in carcinoma. Gumma differs from carcinoma of the tongue in that, when the tissues start to break down, there is not an increased size of the tongue accompanying the destructive process in the earlier stages of development. In the discussion of leukoplakia, I have never heard such definite specific statements made with regard to diagnosis in its relation to syphilis as has been presented here today. I sincerely hope that time will prove the truth of this statement and I wish to thank Dr. O'Leary for bringing this information to us. His statement, as I understand it, is that, if the leukoplakia patch is blue, it always means a leukoplakia of syphilitic origin. My experience has been that it is sometimes difficult to say just what is blue and what is gray in the appearance of these leukoplakia areas. I take it that we all agree, without regard to the color of leukoplakia patches, that, if there be engrafted on any such area a lesion of horny-like development, a piling-up of the cells into a definitely roughened surface, it surely should be looked on with suspicion and sufficient concern to justify its removal either by the use of the cautery or ordinary surgical removal. From the combined statements of Dr. O'Leary, one should reach the conclusion that it is the duty of the dentist to be able to differentiate the healthy from the diseased structures of the mucous membrane of the tissues of the mouth. In questions of doubt, he should seek the advice of his medical associate, and he should

be aware of the fact that carcinoma in its beginnings can be cured; but the safer plan is to see to it that precancerous lesions are removed; for, as has been pointed out, if there is a delay until these malignancies reach the glands of the neck, the life of the patient cannot be saved, regardless of the plan of operation followed. The most favorable locations with reference to results are the border of the lower lip and the tip of the tongue, for case records prove that, when these are surgically removed in the early stages, the life of the patient is usually saved. But since many successful operations are performed for the control of cancer appearing on other tissues of the oral cavity, all suspicious deviations from normal must call for thorough examination and exact diagnosis at the earliest possible moment.

J. Garland Sherrill, M.D., Louisville, Ky.: Important points in connection with the diagnosis of a syphilitic lesion about the mouth are:

The initial lesion varies considerably in appearance. It rarely shows the typical hunterian sore. Occasionally, it presents as a smooth abrasion with an indurated base from which exudes a thin serum. Under other conditions, it appears as a ragged, undermined, hard sore, or it may perhaps present as a soft ulcer with sharp edges. The lesions on the inside of the cheek or on the palate or tongue are more likely to be soft ulcers than are those on the lip. Occasionally, there is but slight induration around the base. These primary lesions are not as a rule painful. They do not heal readily, and promptly present a painless lymphatic enlargement of considerable size in the adjacent group of glands. The secondary sores are more prone to assume the soft type. There is less induration about the base of the sore, more excavation to the edges and a seropurulent discharge. Sometimes, a patch lies over the sore. These growths are also painless, but are quite sensitive to heat. The glandular involvement is general rather than localized, and not permanent as a rule. Tertiary lesions are usually of the ulcerative type, most likely to be found at the junction of the hard and soft palate, sometimes presenting there as a deep ulcer, or again as a proliferating granuloma. They are also seen on the palate, tonsils, tongue and cheek, but most frequently on the palate. The glandular involvement is general. These lesions are only occasionally painful. It is exceedingly important to differentiate between lesions of syphilis and those of cancer. It is well to remember that all syphilitic lesions with rare exception will show prompt improvement under mercurialization or the use of arsphenamin. Sometimes, they disappear like magic under iodid of potassium. The presence of a positive Wassermann reaction is diagnostic of syphilis. It does not, however, indicate that cancer does not also exist. It may be safely stated that any lesion which is suspected of being syphilitic and which does not disappear after three weeks of active treatment is very likely to be malignant in type. Secondary and tertiary lesions occurring about the mouth should in most instances give a history of a primary lesion elsewhere, although occasionally the reaction at the beginning of the disease was so slight that it escaped the notice of the patient. The diagnosis between syphilitic lesions and carcinomatous lesions is so important and can be determined so positively that unusual delay in making the diagnosis of carcinoma after the lesions fail to heal under syphilitic treatment is not permissible. Syphilis of the tongue can unually be differentiated from leukoplakia and the rarer condition of tuberculosis of the tongue. Dr. O'Leary is correct in his statement that all the late syphilitic lesions do not ulcerate, and therefore the induration and the sensation of hardness with deep infiltration on general palpation is of great diagnostic importance.

Samuel L. Rabkin, Cincinnati, Ohio: A man came to me complaining of a pain in the lower left jaw, radiating toward the neck. I observed his mouth with a mouth mirror, exploring with my fingers to determine whether there was any swelling about the roots of the lower teeth. I could find nothing that would show why the patient had trouble with the lower teeth. I extracted the teeth, fearing that they might be the cause of the pain, because one of the molars had been infected about two months before the patient came in. I could find no reason at all, and I said, "I cannot find anything wrong with your teeth." In talking to the patient, I noticed a little erosion on his lips, no larger than the diameter of a lead pencil. Now and then, as he talked to me, he would lick the area with his tongue, which made it appear somewhat more suspicious. I asked him how this came to be there. He said, "I think it is a fever blister." I asked him whether he would have

a microscopic examination of a little smear from the exudate. The dark-field examination revealed the presence of spirochetes, which was finally substantiated by the Wassermann test and the personal history. Now, there was no induration and so sign of or appearance of a chancre. The lip looked normal, and, as I said, the only erosion was so minute that I would not have regarded it with suspicion. It is easy for one to be careless in feeling around and examining a mouth of that sort having any little erosion. Examining with the fingers, you say, "I don't find anything wrong with your teeth, and at the same time you assume the chance of being infected. We should examine the lip and tongue before we make any examination of the inside of the mouth.

Dr. O'Leary (*closing*): The syphilitic luekoplakia which is found frequently in the commissures of the mouth, on the tongue and cheeks, is striated and has a bluish hue. It is usually associated with atrophic glossitis. This is in contrast to the traumatic leukoplakia which is more circumscribed, nonstriated and gray. We do not believe that the deciduous teeth are of diagnostic value in the recognition of congenital syphilis. The permanent teeth may show pathognomonic changes. Arsphenamin will sterilize the active lesions of syphilis. One dose will, within a comparatively short time, rid the mucous patch or chancre or the recurrent mucous membrane lesions of *Spirochaeta pallida*; hence, the employment of arsphenamin is of value as a public health measure. If an individual has been in contact with the suspected lesions of acute syphilis, the liberal use of soap and water followed by inunction of the part exposed with 33 per cent mild mercurous chlorid (calomel) ointment is probably the best prophylactic measure, next to the use of arsphenamin. *Spirochaeta pallida* is not a virile organism; hence, ordinary soap and water will kill it almost immediately. However, when contact has been made with lesions known to contain the spirochete, or after needle pricks, etc., incurred while working on patients known to have syphilis, an immediate course of intravenous arsphenamin in addition to the local use of mild mercurous chlorid ointment is justified. The use of arsphenamin as a prophylactic measure in this manner is justified apparently by past experience. The sterilization of all instruments used in dental work is necessary. The Wassermann test as an aid in the diagnosis of syphilis may be misleading. In late syphilis, the Wasermann test has an estimated value of 75 per cent. In other words, we look on a positive reaction as essentially another indication of the condition presented by the individual in whom we suspect syphilis. If the Wassermann test is reported positive, we must not lose sight of the fact that the patient may have various other maladies in addition to syphilis. There is an unfortunate tendency to ascribe all the ailments of a syphilitic to syphilis and to ignore the possibility that an intercurrent disease may be present. In regard to the history of syphilis, in checking over the records of a large number of patients, we find that 35 per cent of our men and 48 per cent of our women patients do not give a history of syphilis. When a patient who is found to have clinical signs of syphilis is confronted with the findings and he continues to deny a history of having had syphilis, he is often telling the truth, because he acquired syphilis without recognizing the early manifestations of the disease. The treatment of syphilis is satisfactory, if thorough. The effort to make it thorough is often difficult. In the propaganda for the control of syphilis, I do not believe we will get far by discussing the disease as a purely venereal problem. We are unable to control sexual activities by legislation, but we can educate the public in regard to the severe physical handicaps that result from the disease. It is my belief that more stress should be laid on the medical aspects of the disease and less on the moral, until the time arrives when we can discuss syphilis as we do tuberculosis today.

GOLD INLAYS

By E. T. TINKER, D.D.S., Minneapolis, Minnesota

(Read before the Massachusetts State Dental Society, Boston, Mass., May 4-6, 1925)

IT WAS with a great deal of hesitancy that I accepted the invitation of your Committee to give a paper on gold inlays, as the subject is one which has been dealt with from so many different angles that, it appears to me, there is little left to be said.

I shall deal with the methods that I employ in my own practice, and shall try to convey to you my understanding of them and their technic.

My conception of a gold inlay operation deals not only with the methods of technic employed in its construction, but with the inlay itself, which is more particularly a means to an end, from the point of restoring a tooth to its normal function.

In order to attain this finished result, we must take into consideration the importance of the following: proper cavity preparation, proper carving of wax pattern to contours, occlusal anatomy, investing and casting, finishing, sterilization and cementation.

In my office, I find use for all of the methods I know, in the construction of gold inlays, and the order in which I most frequently use them is: direct, direct-indirect, and indirect.

By direct, I mean the construction of an inlay, from the wax pattern to the finished result, working directly from the teeth.

By direct-indirect, I mean the technic of constructing an inlay by making an amalgam model of the tooth from the modeling compound impression, and constructing the inlay by taking a wax impression of the cavity, in the mouth, carving the occlusal third in the mouth, and then transferring the partly carved pattern to the amalgam model, and completing the carving on the model.

The indirect method differs from the direct-indirect only in that the entire taking of the wax pattern is done on the amalgam model.

It is only within the last few years that I have recognized any method in my practice other than the direct. I have believed, and still believe, that every time we remove the operation from the tooth to a model, we are adding that much chance of failure for the reason that, in taking an impression and making an amalgam die, we are dealing with materials that may give us a slight deviation from the original. On the other hand, I recognize the advantage of the direct-indirect and indirect methods in complicated, deep-seated cavities in molars and in some bicuspids, and also in such castings as those which encircle the tooth. Also, in cases of excessive bulk in the metal, in which we have added shrinkage owing to the bulk, we are better able to seat our castings

in the model, than we are in the tooth directly. The finishing of such inlays is also much easier when done in this manner.

The greatest value of the model method, in my mind, and the one that converted me, was illustrated in Dr. Coston's method of seating the inlay

Fig. 1.—Buccal cavity, in which the indirect method is always used, owing to the difficulty of finishing without laceration of the tissues.

in the model by the swaging process, before its insertion in the tooth. For the reason stated, at the present time, I am now an advocate and user of all three methods mentioned, as I am fully convinced that each has its definite field.

From this point on, I shall endeavor to explain my procedure in the different methods, from cavity preparation to cementation.

I shall first consider all buccal and labial cavities that extend beneath the free margin of the gum in which gold inlays are indicated (Fig. 1). The indirect method is the one always used, for the reason that the carving of the wax pattern and the finishing of the gold inlay directly in the mouth is well nigh impossible in my hands without undue laceration of the soft tissues. Such in-

Fig. 2.—Mesioclusal cavity in bicuspid of simple type; inlay made by direct method.

juries should be avoided not only in these specific cases, but also in all operations at any time.

In preparing these cavities, my preference is given to the smallest cylinder type stone that I can procure, making a cavity with a very definite outline, the walls practically parallel and the seat flat, and beveling the margins to an angle of approximately 45 degrees. I use a short marginal bevel, for the reason that I merely wish to protect the short enamel rods, retaining as much of

the perpendicular walls as is possible for retention.

The taking of the impression is accomplished by shaping a cone of black compound, the flat end of which is either attached to a spatula or held against the thumb, softening the point with dry heat and pressing into the cavity, which has previously been treated with petrolatum, and exerting the pressure toward the gingival line. While the compound is under such pressure, I thoroughly chill it with ice water, and then remove, invest and pack with copper amalgam. I prefer copper amalgam because it produces a harder working model than do the alloys.

Fig. 3.—Mesioclusodistal cavity in bicuspid; inlay made by direct method.

In carving the wax pattern, I leave a slight overhang, giving a plus margin on the casting, which is fitted to the model and put through the swager. I now take a fine stone and go over the entire surface of the inlay, thinning down the surplus margin, then reswaging it, which seats the inlay firmly in its position; going into the cavity slightly deeper than previously; turning up a thin margin of gold all around the periphery, and definitely showing a boundary line. Polishing disks are now used to complete the finishing of the

Fig. 4.—Mesioclusal cavity in molar of simple type; inlay made by direct method.

inlay, which, after cementation, is practically complete.

Conservation of tooth structure in all teeth is of vital importance, and should be a large factor in deciding for us the method to be used, direct or otherwise.

Fig. 5.—Distoclusal cavity in upper molar, extending lingually through developmental groove; direct method.

In all cases of incipient proximal decay in bicuspids and molars, less tooth structure will be sacrificed if we use the direct method in either mesioclusal-distoclusal or mesioclusodistal cavities, than were the indirect method used. Especially is this true where we have teeth of decided contour, simply because one cannot draw a modeling compound impression without more or less distortion at the gingival-labial or gingival-buccal angles. In these cases, my procedure is always directly to the tooth, but when the opposite is true and extensive decay is present, carrying these cavities far enough to the buccal and lingual, and when the cusps are involved, I do not have distortion to contend with in the drawing of the modeling compound impression. On the other hand, castings to reproduce these restorations will necessarily be bulky, and casting them without shrinkage is a more difficult matter. Therefore, I use the direct-indirect method.

Fig. 6.—Mesioclusodistal cavity in molar protecting the cusps; direct-indirect method.

Figures 2-5 illustrate the types of cavities in which I prefer the direct method. In these types, no attention

need be paid to extension for accessibility. In other words, the drawing of the pattern from the labial and buccal angles gives us no trouble at all. Extension for prevention is all that is necessary. By extension for prevention, I do not wish it to be understood that I require a face of gold, but, on the contrary, merely a definite line of gold extending from the gingival to the occlusal, which is visible for its entire length when the inlay is in position, protecting the vulnerable points at the gingival angle from future disintegration.

Fig. 7.—Complicated mesioclusodistal in molar; direct-indirect method.

The gingival seats of these cavities must be flat, meeting the buccal and lingual walls almost at right angles. The axial wall should be at a right angle to the gingival seat as well as the seat of the occlusal step. Buccal and lingual walls are slightly divergent from gingival to occlusal margin. A decided bevel is necessary on the gingival, but not on the occlusal. These margins are treated just as is a properly prepared cavity for an amalgam filling, reason for so doing being the fact that the inlays are more readily seated to position than when a margin such as is made for a gold foil filling is used.

In taking the wax impression, I do not use a matrix for a mesioclusal-distoclusal or mesioclusodistal inlay, when the contacting teeth are in position, relying on the surfaces of the neighboring tooth to hold the wax in position while it is being forced into the cavity. My exceptions to this are those cases in which the cusps must be restored, or the cavities extend a considerable degree beneath the gingiva.

As soon as the wax is adapted to the cavity, the patient is instructed to close, and to move the teeth slightly, as in mastication. A thin piece of rubber dam is now placed over the pattern and the patient is told to close again, as firmly as possible. At this point, the wax is chilled and removed, and if the cavity is at all deep, a thin layer of wax is added to the gingival ends of the impression, softened, and forced to place in the tooth.

This is done for the reason that, in cooling, the wax contracts, and although we may have a definite impression, the gingival seat of our wax pattern so carved, without additional wax, would show at this point a slight discrepancy.

The wax is now removed, and, with a sharp carving lancet, all surplus is carved down to the gingival margin and up to the contact points. It is now placed in the tooth, and the occlusal surface is carved before all the surplus on the buccal and lingual is removed, the reason for this being that the buccal and lingual excess serves to stabilize the wax pattern in the tooth during this part of the operation. The wax is now carved to contour and the margin finished with a small ball of cotton moistened in a lubricating oil of eucalyptus or cajaput, followed by a dry pellet, which removes the solvent.

Approximal surfaces are now polished by the use of a china silk strip, while the assistant steadies the inlay in position. The sprue is attached in the marginal ridge at an angle diverging from the occlusal surface, for the reason that all margins when invested should be beyond the point of the entrance of the gold into the mold.

The molars and bicuspids, as shown in Figures 6 and 7, are treated largely by the direct-indirect method, decay in these teeth having progressed to such a point that their preparation makes the drawing of the modeling compound impression a simple and definite matter; and, as stated before, the excessive amount of gold contained in the castings necessarily causes more shrinkage and makes their adjustment difficult when directly in the tooth. Caries, many times, progresses extensively beneath the gum tissue. This, coupled with inaccessibility, puts a tax on the carving of the wax pattern, as well as on the finishing of the gold inlay.

In the indirect method, we find this disadvantage largely removed. The preparation for the two methods is essentially the same in every molar and bicuspid preparation, with the exception that they are more extensive. In taking the modeling compound impression, my procedure is to select a half inch band of copper or aluminum, of the proper size, 36 gage, and one that will give at least 0.5 mm. clearance of the tooth at all points, trimming the

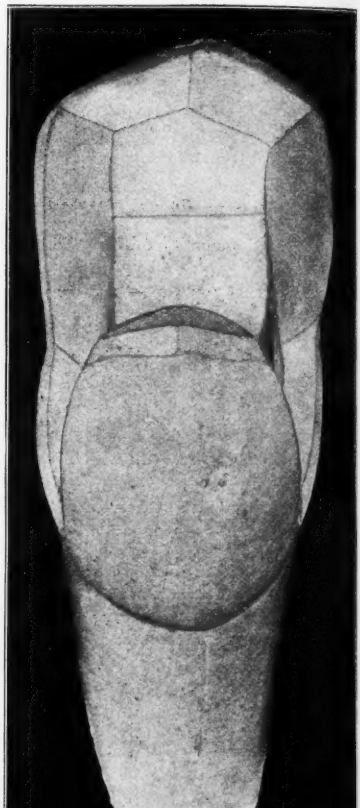

Fig. 8.—Extensive mesioclusodistal cavity protecting the cusps in bicuspid; direct-indirect method.

gingival end so that it will reach all portions of the cavity and adjust itself to position. A cone of black compound that will just fit inside the band is selected, the tooth being lubricated with petrolatum. The band is placed in position, and held with the thumb and first finger. The cone is thoroughly softened for about two-thirds of its length with dry heat, and is carried into the band and forced down until the excess appears around the gingival end. The compound is then thoroughly chilled with ice water. By thoroughly chilled, I mean the water is applied until it is certain that the entire bulk is hard. Many failures result from removal of the impression before it is thoroughly chilled, distortion resulting.

In deep-seated cavities, we sometimes fail. In these cases, I thoroughly dry the first impression, add a thin layer of stick compound dropped from a heated point, and force it back into position. In this instance, the first impression acts as a matrix, carrying the added compound ahead of it, until it reaches the deep recesses of the cavity, giving us the impression. A thin piece of paper is now wrapped around the band and the impression invested in plaster. The die is then finished. At the same sitting, I select another band, preferably of aluminum (for the reason that it is much more pliable than copper, and can easily be contoured to the shape desired) trimmed so the teeth will close in occlusion, and cut out a V-shaped opening on the proximal surfaces, so that when the band is in position, the contact points of the neighboring teeth are in view; burnishing the balance of the band back against the labial and lingual angles of the neighboring teeth, so that when the inlay wax is forced into position, an impression of their anatomy is obtained that will aid us materially in producing the anatomy of the tooth on which we are working.

The occlusion is now obtained in the same manner as for the direct inlay. The band is removed, and the wax is placed back on the tooth and the occlusal third carved, the contact points and embrasures as well as the occlusal anatomy being reproduced. It is now transferred to the amalgam die, which has previously been lubricated, and the carving completed. The wax is carved down to the finishing lines, and then a thin bead of wax is added to it, especially on the gingival side, giving us a surplus margin.

It has been my experience that inlays up to the size necessary for a mesioclusodistal molar do not give us enough shrinkage to make their proper seating a difficult matter. Beyond that point, our troubles commence, and, as I have stated before, shrinkage does hamper us in the proper seating of these large castings; but as long as we have a model duplicating the tooth, those castings showing slight shrinkage are not necessarily failures. Margins showing defects may be easily repaired and a well nigh perfect margin result, by burnishing a 1:1000 platinum foil over the margin in question, placing thereon a small amount of sticky wax and inserting the inlay to place in the model, after which it is swaged to position, removed and invested, and the discrepancy repaired with a high carat gold solder. After this, it is placed on the model and finished.

Some of the best operators swage a matrix for the entire cavity, after which the casting is placed in position and swaged home; the two are tacked together with wax and invested, and the entire matrix is united at the margin

with a small amount of solder, and then finished.

I have always been of the opinion that, were it not for the time consumed, no better fitting inlays could be made for large cavities by the casting process than are possible by the swaged platinum matrix and pure gold method.

In the six anterior teeth, I almost invariably utilize the direct method, largely because of accessibility, my main exception being the labial cavities that I have described in detail. These teeth are easily reached from all angles, and the same difficulties presenting in molars and bicuspids do not obtain here. The margins are easy of access to both carving and finishing, and my experience has been that, for some unexplainable reason, the finished operation in my hands is much better accomplished by the direct method.

Cavities I will place under three

Fig. 9.—Simple proximal cavity of the six anterior teeth; inlay inserted from the lingual; direct method.

Fig. 10.—Proximal cavity in anterior tooth involving the angle; balance of the incisal intact. The preparation is an extension of that shown in Figure 9; direct method.

heads: simple proximal, mesioincisal and distoincisal, mesiodistoincisal and their deviations.

Simple proximal cavities, illustrated by Figure 8, are, as a rule, operated on from the lingual aspect, showing little in the way of gold from the labial, unless the decay is extended. Retentions are placed opposite the line of force, which prevents their dislodgment. Margins are carried to a point where they are supported by dentin. The gingival seat is a straight line from the gingival-labial to the gingival-lingual angle. The axial wall practically parallels the approximal surface in question. Retention grooves are placed at the junction of the axial with the incisal and gingival walls, paralleling the gingival seat. All margins are treated with a short bevel.

In preparing the wax pattern, a cone of wax is employed, softened in dry heat and forced into place. With a thin bladed instrument, slightly warm, the labial excess wax is carved down to the margin. At this point the pattern is withdrawn and the surplus wax carved from the gingival margin up to the contact point. The wax is then reinserted in the cavity and the carving of the pattern completed. After this, a thin strip of china silk is passed between the pattern and the opposite tooth, and, with a gentle drawing motion toward the labial, all margins are burnished. The inlay is now moved from the cavity by attaching a sprue to the lingual surface and gently drawing inward, after which the contact point is slightly overcontoured by a small bit of wax, and invested and cast. A deviation from this type of cavity is one frequently met in lateral incisors, which include both proximals and the lingual fossa.

In these cases, two proximal cavities, as just described, are prepared, and are joined by a cavity through the lingual fossa. The carving of the wax pattern is accomplished in the same manner.

In treating mesioincisal and distoincisal cavities, we have two preparations, illustrated by Figures 9 and 10.

Figure 9 illustrates a cavity in a tooth on which the incisal surface has not been worn down by abrasion. The enamel on the incisal portion, on the balance of the tooth outside the part affected, is intact. This preparation is but a continuation of that used for simple proximal cavities, except that the incisal angle is involved, and the lingual retention, carried over the lingual surface toward the incisal, is of more generous size. The groove from the lingual to the labial margin at the

Fig. 11.—Cavity in anterior tooth involving the incisal; direct method.

gingival is exactly of the same construction. By the use of this preparation, we show the minimum amount of gold, and still have a very serviceable inlay.

Fig. 12.—Extensive mesioincisodistal in anterior; direct method generally used.

Figure 10 illustrates a tooth with a proximal decay involving the angle, and one in which the lingual plate has been worn by abrasion until the dentin between the two plates of enamel is exposed and many times grooved, and in some cases discolored.

The preparation of these cavities consists of making a flat gingival seat, meeting the axial wall by an acute right angle, and reducing the incisal end of the lingual plate of enamel, until we have sufficient bulk of metal for strength and protection of the labial plate, which is slightly reduced and beveled to protect it from fracture, carrying the incisal preparation well to the opposite side of the tooth, with a shallow groove extending its entire length in the dentin, between the labial and lingual plates of enamel. For retention the groove is placed on the axial wall, extending from the incisal groove to the gingival labial angle. This is reinforced by a groove placed at the junction of the axial wall with the gingival-lingual angle, making a boxlike retention. In addition to these grooves, a pit is sunken, parallel to the long groove, at the opposite terminus of the incisal groove, which is occupied either by a 21 gage iridioplatinum wire, or the casting itself, all margins carrying a slight bevel.

Mesioincisodistals for cavities having a sufficient thickness labiolingually at the incisal surface to accommodate a shallow groove between the two plates of enamel are but a continuation of the cavities illustrated by Figure 10.

We have another class of incisors, of a very thin type, which will not allow a heavy enough body of gold labiolingually across the incisal end for the strength necessary to keep the inlay in position. For this type of tooth, I use a preparation illustrated by Figure 11, which differs from the preceding one only in that we have what amounts to a double step.

For the first step, an area of the lingual plate of enamel is removed, sufficient to give us an acute angle at the junction of the incisal end of the lingual plate with the labial. The enamel is now removed farther toward the

gingival, the margin of the cavity, which is now the terminus of the second step, being carried beyond the point of impact with the lower teeth.

This gives a sufficient bulk of gold across the lingual plate, joining the two sides of the cavity, and thickened somewhat by the depth of each step, even though it is thin throughout the balance of the casting, to make a strong inlay.

Instrumentation is accomplished with stones of a cylinder and long tapering type, inverted cone burs, cross-cut inlay burs and tapering plug finishers, and discs for truing up margins. The bevels on the gingival seats are finished with a small cylinder stone, beveled to an angle of approximately 45 degrees, or chisels of suitable angles, or both, which will accurately reproduce a margin of the same. The technic of obtaining the wax pattern does not differ materially from the one described for proximal cavities, except that, for large cavities, the wax is usually softened by moist heat, as the mass must be more generally uniform than is desired for a small cavity, for the reason that it must be forced into contact with more surfaces and equally distributed. The carving and finishing is accomplished in the same manner.

Little progress has been made in improving the technic given to us by Dr. Taggart when he brought out the cast inlay. Some men have made slight deviations, and some have made radical ones, but I believe that the basic principle was correct, and excepting slight changes and more definite detail in the elimination of the wax, the process is essentially the same as when we received it.

In our office, we follow the Taggart technic with the exception of the wax elimination.

After considerable experimentation, which I am still carrying on, I have come to the conclusion, as have a great many other men, that slow elimination at a low heat gives the best results. From the fact that plaster of Paris disintegrates at between 370 and 380 degrees, experiment seems to prove that all heats used in the elimination of wax must be below that figure.

I have made many of my best castings by placing the molds in the oven when I leave the office in the evening and taking them out at approximately 9 o'clock the following morning, having the heat turned on at a low degree, the thermometer at no time registering more than 290 degrees. By this method, we merely allow the wax to absorb into the warm plaster.

Because of the time consumed and the uncertainty of electric currents, I have discarded this method for one of shorter time.

Inlays cast by the foregoing method produced beautiful surfaces, but, in a certain percentage, the margins were not so sharp as was the pattern from which they were molded. In other words, the technic did not come near enough to 100 per cent to be usable. In fact, my experience convinced me that the actual flame is necessary to ignite and burn all wax residue from the mold, but is not desirable during the burning-out process.

The method that I am now using seems to give me constant reproductions of my wax patterns. I place the molds in the electric oven with the cover off and the current turned on full for a period of from twenty to twenty-five minutes, which thoroughly drys them. They are then placed over a Bunsen burner for a period of from five to

seven minutes, the smoke test determining when they are ready.

One may cast either hot or cold, as desired. I do not see much difference in the result. We employ the cold mold.

The surface of the castings should have the same gloss as pure gold after it has been melted and allowed to cool. The castings with these surfaces are easily fitted into the cavities and produce the best inlays.

I do not wish it understood that I consider this technic final: I hope that in many ways it will be improved on; but, up to the present time, it has given us the best results.

After the casting is made, it is examined under the magnifying glass for any imperfection. If the direct method is employed, it is then taken to the tooth and the contact points adjusted until it is determined whether or not it will seat itself in position. If there is any resistance the inlay is removed and the cavosurface examined. Burnished spots will indicate where relief must be made. This procedure is repeated until it goes to place without resistance.

It is now tested for occlusion and adjusted until the occlusion is correct, after which the inlay is removed from the tooth cavity and the anatomy accentuated.

On the occlusal surface, the best instrument for accentuating the anatomy is a No. 40 inverted cone bur, which produces sharp lines in the sulci and pits. Then, plug finishing burs of suitable shapes are used to smooth out the cuts produced by the inverted cone. The marginal ridges, especially at the contact points, should be depressed slightly beyond the impact of the opposing teeth, for the reason that, in the act of masticating, we get involuntary movements of the jaw that will reach these ridges and batter them, which we cannot get patients to give us in the chair.

On all bicuspids and molars, we should carry the developmental grooves through the marginal ridge and part way down the side of the approximal surfaces, in the positions where we find them divided in the natural teeth. In the bicuspids, both the mesial and the distal, and the mesial of the molars, we find this division just lingual to the point of contact, producing what we may know as the ear on these teeth, as well as the embrasure.

On the upper and lower first molar, on the distal surface, we find the marginal ridge generally divided both buccally and lingually to the contact point. These are essential points along with the proper cusp formation in the occlusal anatomy.

The occlusal surfaces, with the exception of the margins, are now finished with the aid of a polishing wheel, pumice and sulci disks. The inlay is now placed in the tooth, and all margins are stoned, the instrument being revolved so that it draws the gold to the margin. With a slight tap of the mallet, a stick of wood being used as a plunger, the inlay is now seated in position.

In all cavities, mesioclusal, distoclusal and mesioclusodistals especially, this tap will raise a fine line of gold around all margins, proving that unless such stoning is done before the inlay is cemented, the inlay does not reach its position.

The margins are now finished with the aid of finishing disks, and the gingival margin is tested with an explorer for any slight overhang that may be present. Should the overhang be excessive, it is reduced outside the mouth. In fact, these margins are finished by the aid of testing with the

explorer, any overhang detected being removed.

Strips are not used in my office for the finishing of gingival margins, because, as I stated before, the laceration of gingival tissue is a thing to be avoided, and they are a dangerous agent in my hands.

Burnishers are not used on the gold margin, for the reason that any gold, other than pure, is too rigid to permit anything to be gained, and the danger of breaking down the enamel rods is so great under such burnishing that, when I am unfortunate enough to have an inlay margin that is imperfect, I prefer to make it over. Right here, I wish to mention the dangers attending the seating of an inlay. No inlay should require force other than hand pressure, and that gentle, to seat it in a tooth. Many a tooth is ruined by the attempt of the operator to force it into place, and many cases of pulpitis are caused by pressure on the axial walls of the cavity, by the inlay being too tight a fit. Especially is this true of the mesioclusodistal or U-shaped inlay. Teeth are fractured, and these fractures, which may not show up for years, result in the death of the pulp.

In cavities that nearly approximate the pulp, the wax pattern is relieved, the filling of a sufficient thickness of cement being thus made possible, and also, in many cases, the use of a sedative agent immedately over the pulp to protect it from thermal shock after the inlay is cemented.

This relief can be made in one of several ways: (1) by building in protecting agents before the wax pattern is made; (2) by trimming away the pulpal wall of the pattern with a sharp lancet, or (3) by cutting away the gold after the inlay is cast. When the pulp is dangerously close, undoubtedly the first method is preferable, since the pressure exerted in forcing the wax to position—or if done by the indirect method, of taking the modeling compound impression—is liable to produce a hyperemic condition.

In cavities in which we have small lines of decay over the pulpal and extending back under the labial and buccal walls, it is permissible, and I believe good practice, to prepare the cavity until all the margins are supported by dentin, leaving these small surfaces of decay in order not to produce an undercut until our wax patterns are made and the casting fitted. When this decay is thoroughly removed, the recesses so produced are filled and the inlay cemented with the one mix of cement.

Not only does the one mix of cement save time, but, I believe, we have a better cementation of our inlay, as a mix of cement does not adhere to a previously set cement as it does to the tooth itself. All remnants of alloy fittings must be thoroughly removed, as there is a certain action on cement placed between gold and amalgam which destroys the cement.

Before cementation, we should see that the cavity is sterilized. Many agents are employed for this purpose, some of them causing considerable pain to the patient. I prefer compound solution of iodin U.S.P. for this purpose, for the reason that many cavities have a seepage of the fluids of the mouth around temporary fillings, during the interim between preparing and setting an inlay, and if any considerable time elapses, we will find a bacterial plaque, from a small to a considerable amount, deposited in the recesses of the cavity. Compound solution of iodin, being aqueous, does not have the cauterizing

effect of the tincture, and acts not only as a sterilizing agent but as a disclosing solution as well, showing up all discolored plaque present. This is easily removed by a small pledget of cotton dipped in fine pumice and water, after which the cavity is dried with bibulous paper to remove all excess fluids, and then wiped with chloroform. Unless we have seepage from the gingival tissues, this, as a rule, is all that is necessary, warm air only being used where such seepage exists.

Cavities should never be dried until the surfaces are dessicated, as we all know that our cements are hydraulic and teeth are much more sensitive following cementation when such intensive drying is resorted to, because of the absorption of the free phosphoric acid by the open tubuli.

Cement should be mixed slowly, a little of the powder being drawn in at a time and the entire amount kept spread in a thin film over the mixing slab, until it is placed in the tooth. Cement so handled will not generate heat, which is an important factor in the setting of the inlay. Both the cavosurface of the inlay and the cavity are coated, and the inlay is firmly seated in position.

A great deal has been said as to the propensity of various metals, especially in regard to those that contain certain alloys, to produce trauma, and I feel that a paper on the inlay question should touch on this subject.

Pure golds undoubtedly have their place in such cavities as the proximal in anterior teeth, and labial and buccal and simple occlusal cavities.

Twenty-two-carat gold can be used in all of these, as well as mesioclusals, distoclusals and medioclusodistals in all molars and bicuspids, in which the question of building up the occlusion does not enter. In bridge abutments, anterior inlays involving the incisal edge, and all cases in which the building up of the occlusion is the primary motive, highly alloyed golds approximating the hardness of the enamel must be used. But, in using them, a definite understanding must be had of occlusion.

The occlusion must be treated the same whether it is a question of a row of inlays extending from cuspid back to molars or a bridge; that is, it must be brought to as fine a point as possible by spot grinding, finishing by having the patient mill it in with a preparation consisting of adhesive powder mixed with water to a gummy consistency, after which either No. 80 or 100 carborundum powder is added to it. This preparation adheres to the teeth during the process of trituration. Thus, the proper occlusal planes will be developed, which will work in unison with the condyloid paths. Teeth should be tested for excessive movement by applying the tip of the forefinger to them, and when movement is found, relief should be given.

In other words, balanced occlusion is just as essential in the case of teeth that have large restorations individually as it is in teeth used as abutments in bridge restorations.

Cases should be examined at intervals to note any change that may have taken place, and corrections made.

If this attention is given, I believe we may still retain our highly alloyed golds for what they are worth, and minimize the trauma caused.

BLOOD CELL COUNTS IN DENTAL INFECTIONS AND THE DERIVATION FROM THEM OF A NUMERICAL HEALTH INDEX

By H. E. HARVEY, Phar.D., D.D.S.; H. B. LaFAVRE, M.D., and S. P. HESELTON, Washington, D. C.

(Read before the District of Columbia Dental Society, May 26, 1925)

UNTIL recent years, the predominating effort in dental investigations has been directed toward solving mechanical problems. The work of Billings, in 1913, induced a departure from this trend of thought, and has caused more consideration to be given to the possible relationship of dental infection to systemic disease.

The following data are the result of an effort made to determine what effect the eradication of dental infection has on the systemic condition. The means employed was a series of differential blood counts taken before and after the eradication of dental infection. No definite conclusions have been drawn as to the value of the work, and further investigations are being conducted.

Practically all of our cases showed that, after the eradication of dental infection, changes occurred in the ratios of the various cellular elements of the blood, with a return to normal ratios. It is believed that a general, systemic depression may result from the presence of dental focal infection in certain cases, and that immunity may thereby be impaired. This lowering of resistance may be slight enough to escape detection by means of present diagnostic methods.

The factors of differential blood counts, presented in Table 1, were considered in each case. The figures in all except the first line (the assumed normal blood count) represent the averages of findings when dental infection was present and when dental infection had been eradicated.

It is believed that the method of determination to be described will indicate the presence of low grade infection when the resistance of the individual is effected, although it will not indicate specifically the presence of dental focal infection unless atria other than the teeth have been eliminated from consideration.

In an effort to determine quickly and accurately deviations of successive differential blood counts from an initial count, and the relationship of each to a standard normal, mathematical proportions, graphic charts and mechanical sliding rules were utilized. For the mathematical computation of deviations

TABLE 1.—DIFFERENTIAL BLOOD COUNTS

	Red Cells	Hemoglobin Per Cent	White Cells	Polymorphonuclears Per Cent	Lymphocytes Per Cent	Coagulation Time Min.	Health Index
Assumed normal count	5,000,000	90 (Talquist) 100 (Dare)	7,250	68	27	3	100.0
Cases free from infection	5,087,000		7,360				98.0
All Cases with dental infection	4,590,000		8,720				92.5
Cases with dental infection (less those having high resistance)	4,440,000		9,000				91.5
Cases after eradication of dental infection	5,190,000		7,420				98.7

from a standard count, Table 2 was evolved by means of a sliding rule. All of the factors are correlated into a single numerical health index, which represents the patient's relation to normal at the time of the count. Subsequent counts determine at a glance whether the condition of the patient seems to be approaching or receding from the assumed normal.

Difficulty was encountered in the endeavor to establish normals for each factor, as, in the past, wide variations have been accepted as being within normal limits. In every case not complicated by other diseases after the patient had become free from dental infection, the blood counts gradually settled down to extremely narrow limits of variation, and since all of them resulted uniformly, the figures thus obtained were utilized as the standard for the determination of variations. In the past, the variations commonly accepted may have been influenced by the presence of dental infection. Black[1] stated that 78 per cent of individuals who apparently were in normal health showed clinical evidence of dental infection. Haden[2] gives 91 per cent as the incidence of pulpless teeth. No literature is found wherein these factors have been ruled out in making blood counts.

The blood changes previously considered normal and attributed to physiologic causes, e. g., resulting after exercise, or after eating, probably do not occur to nearly the same extent in healthy persons who are not harboring dental infection. A leukocytosis thus excited would seem to be, in part, a reaction to

1. Black, A. D.: J.A.M.A., 71-1279 (Oct. 19) 1918.

2. Haden, R. L.: The Incidence of Pulpless Teeth, J.A.D.A., 11: 730 (Aug.) 1924.

low grade chronic infection. Sabin, Cunningham, Doan and Kindwall[3] are of the opinion that the leukocytosis from digestion and exercise is negligible, and that the increase noted during the day is the expression of a definite rhythm.* The results obtained in their investigations would lead one to expect that a reliable white count index could be obtained by taking the counts at the same hour each day or by an average of white counts taken at 9:30 a.m. and 2:30 p.m.

The relative value assigned each element of the blood was determined by studies of blood counts and the use of sliding rules constructed for the purpose.

It is considered possible that the health index will be valuable in determining the degree of resistance offered in the presence of all chronic low grade infections, whether they are of dental or of other origin. Many persons who apparently are in good health may give low readings, this indicating unsuspected chronic infectious processes somewhere in the body. Elimination of these chronic infections may permit the health indices to return to normal. It will provide a convenient method by which the physician or dentist can follow the results of treatment. Correlation of the factors will show that many blood counts that ordinarily are looked on as normal are, in reality, abnormal and indicative of an unhealthy condition that would otherwise have escaped detection.

The numerical health index is calculated by Table 2, deviations from assumed normals.

TABLE 2.—DEVIATIONS FROM ASSUMED NORMALS*

	Red Cells	Hemoglobin	White Cells	Polymorphonuclears	Lymphocytes	Mononuclears and Transitionals	Eosinophils	Coagulation Time
Assumed normals	5,000,000	90% (Talquist) 100% (Dare)	Upper limit 7,500 Lower limit 7,000	68%	27%	6%	5%	3 min.
Unit of deviation	Each 50,000 cells deviation downward	1% downward	Each 100 cells upward or downward	1% upward or downward	1% upward or downward	1% upward	1% upward	Each ¼ min. upward
Numerical value of unit deviation	0.10	0.10	0.05	0.10	0.10	0.10	0.10	0.12

*Add the numerical deviation values; multiply this sum by 2; subtract result from 100.0. The result is the health index.

3. Sabin, F. R.; Cunningham, R. S.; Doan, C. A., and Kindwall, J. A.: The Normal Rhythm of the White Blood Cells, Bull. Johns Hopkins Hosp., 36, July, 1925.

TABLE 3.—FINDINGS IN CASE 1.

	Red Cells	Hemoglobin (Talquist) Per Cent	White Cells	Polymorphonuclears Per Cent	Lymphocytes Per Cent	Coagulation time Min.	Health Index
8/18/24	4,200,000	80	8,400	61	35	5¼	88.6
9/ 6/24	4,620,000	83	7,600	64	30	5	93.6
11/29/24	5,036,000	90	7,300	67	27	3¾	99.0
12/15/24	5,120,000	90	7,350	68	27	3½	99.5
1/ 9/25	5,040,000	92	7,280	68	26	3½	99.3

Elimination of dental infection was attempted by means of extractions, root canal fillings and the employment of antiseptic cement linings in deep cavities. The following changes were noted in practically all cases: (1) increase in red cells; (2) increase in hemoglobin; (3) decrease in white cells; (4) increase in the percentage of polymorphonuclears; (5) decrease in the percentage of lymphocytes, and (6) decrease in blood clotting time (capillary tube).

If further investigation justifies the assumption that the dental condition is reflected in changes of the ratios of the elements of the blood of individuals apparently in normal health, the health index may be found to possess diagnostic value when sufficient data have been compiled.

The hemoglobin and the red cells undoubtedly have an important bearing on metabolism. If they are found to be depressed by dental infection and dental caries, and the elimination of the infection causes or permits a return to normal, the treatment rendered may have an important bearing on general health prophylaxis aside from its bearing on the comfort of the patient and the prevention of subsequent and more serious dental involvements.

Apparently, the polymorphonuclears tend to decrease in percentage[4] and the lymphocytes to increase,[5] in dental infection. A marked change toward normal follows dental treatment. Daland[6] noted a decrease in polymorphonuclears and an increase in lymphocytes in cases of periapical infection. He found lymphocytosis only twice in 100 cases of chronic disease when no focal infection existed, and states that the lymphocytosis that persists after the removal of periapical infection usually indicates the presence of an undiscovered focus of infection. In Daland's cases, lymphocytosis usually disappeared in from five to eight weeks after the removal of all foci of infection. In our cases, a return to normal was noted in about six weeks and the counts remain normal thereafter. In most cases, as the polymorphonuclears and the lymphocytes reached 68 per cent and 27 per cent, respectively, the other elements of the differential count assumed normal proportions. In many cases, change in coagulation time seems to be in direct ratio to the changes in percentages of the other elements.

Sex, age and environment may be given relative normals as determined by future calculations.

Cases 1 and 2 received dental treatment. Case 3 did not receive dental treatment.

4. Haden, R. L.: The Differential Leucocyte Count in Chronic Periapical Infections, J.A.D.A., 10: 596 (July) 1923.

5. Price, W. A.: Dental Focal Infections, J.A.D.A., 12: 641, (June) 1925.

6. Daland, Judson: J.A.M.A., 77: 1308 (Oct. 22) 1921.

REPORT OF CASES

CASE 1.—Muscular rheumatism and general distribution of ringworm infection (relieved). There were two extractions, including the removal of a dental cyst, and two root canal fillings, following pulp extirpations. The findings are presented in Table 3.

The first count was taken at 10 a. m., after breakfast; second count, 3 p. m., the same day, after dinner (rested); third count, 7 p. m., after dinner (rested); fourth count, 8 a. m., next day, before breakfast; fifth count, 3 p. m., after lunch and exercise at tennis; sixth count, 7 p. m., after dinner.

The findings are given in Table 5. A partial count, July 11, 1924, showed: hemoglobin, 85 per cent; polymorphonuclears, 65 per cent; lymphocytes, 31.

TABLE 4.—FINDINGS IN CASE 2.

	Red Cells	Hemoglobin (Talquist)	White Cells	Polymorphonuclears	Lymphocytes	Coagulation time	Health Index
		Per Cent		Per Cent	Per Cent	Min.	
7/ 8/24	4,200,000	90	10,100	68	30		93.6
9/19/24	4,980,000	90	8,200	70	27	3½	98.2
10/11/24	5,212,000	95	8,200	68	28	3	99.1
12/ 8/24	5,180,000	95	8,000	68	27	3	99.5
1/ 9/25	5,100,000	95	7,900	68	27	3	99.6
3/12/25	5,280,000	95	7,150	68	27	3	100.0
							99.9

CASE 2.—There were no extractions, but there were two root canal fillings following the removal of old root fillings and eleven fillings. The findings are given in Table 4.

CASE 3.—There were four pulpless teeth, as follows: (1) upper right first molar, gold crown, pulp chamber filled, but no evidence of root canal filling, lamina dura indefinite; (2) upper right first bicuspid, gold crown, no evidence of root canal fillings, roentgenogram doubtful; (3) upper right second bicuspid, root canals half filled, large amalgam filling, granuloma suspected from roentgenogram; (4) lower left second bicuspid, excellent root canal filling apparently to apex, lamina dura intact. All the other teeth were vital, with two large amalgam fillings and one small area of caries.

No dental treatment was given. The patient was apparently in normal health. The general physical examination to date is negative. The patient's height was 5 feet 8 inches; weight 136 pounds.

In patients having pulpless teeth, but no dental treatment, with four months between counts the findings were: (1st) 87.8; (2nd) 85.6; (1st) 91.8; (2nd) 85.9; (1st) 99.1; (2nd) 94.9.

A summary of averages of health indices shows: ten cases, no dental infection, 98.0; thirty-one cases with dental infection, 92.4; eleven cases after elimination of dental infection, 98.5.

TABLE 5.—FINDINGS IN CASE 3.

	Red Cells	Hemoglobin (Talquist)	White Cells	Polymorphonuclears	Lymphocytes	Coagulation Time	Health Index
		Per Cent		Per Cent	Per Cent	Min.	
12/17/24	3,256,000	80	8,900	64	32	3½	87.3
12/17/24	3,310,000	80	9,000	64	31	3½	87.6
12/17/24	3,300,000	80	9,600	65	30	3½	87.4
12/18/24	3,426,000	80	9,070	64	32	3½	87.8
12/18/24	3,454,000	80	10,100	63	33	3½	86.5
12/18/24	3,340,000	80	9,200	64	32	3½	87.3

TABLE 6.—SUMMARY OF HEALTH INDICES ACCORDING TO LENGTH OF TIME AFTER TREATMENT (CASE 3).

Time After Treatment	Before Treatment	After Treatment
15 months		97.9
8 months		98.8
2, 3, 4, 5 and 6 months	88.6	99.3
	98.0	99.7
	93.6	99.9
	93.9	99.5
	85.4	90.1
6 weeks	98.5	97.7
6 weeks	93.0	98.6
4 weeks	88.0	96.5
3 weeks	94.6	99.0
15 days	91.8	94.2
12 days	94.2	98.5
8 days		97.8
6 days	92.5	93.4
6 days	95.5	98.1
4 months	93.2	98.6
After onset acute infection (4 mo. later)		96.1

CONCLUSIONS

Dental infection apparently effects the cellular elements of the blood when the resistance of the individual is low, and, on the removal of such infection, the elements tend to resume normal proportions.

It may be found that a physiologic health balance can be expressed in a numerical health index, into the calculation of which enter the deviations from normal of the cellular elements of the blood.

In cases of focal infection in which the resistance of the patient is poor, a depression of the health index may result.

A relationship may be found to exist between the health index and the blood type.

A study of a possible relationship between an abnormal health index and new growths should be considered.

Calcium metabolism may be found to affect the health index.

Observation of the effect of root canal fillings over a continued period of time is desirable, and a further study is in progress.

THE DENTAL HYGIENIST

A BRIEF HISTORY OF, AND PRESENT PROBLEMS ENCOUNTERED BY, HER EMPLOYMENT

By ROBIN ADAIR, B.S., M.D., D.D.S., Atlanta, Georgia

(Read before the American Dental Association, Louisville, Ky., Sept. 23, 1925)

IN the year 1898, at the office of M. L. Rhein of New York, I first saw a young woman cleaning a set of teeth. Dr. Rhein called her a dental nurse, and he had written several articles advocating the employment of a dental nurse for office oral hygiene. His suggestion was slow of adoption, and the following ten years saw few dentists avail themselves of the innovation.

Violent opposition was often voiced on the floor of the conventions, and many dentists who employed a dental nurse were ridiculed and criticized. This state of affairs continued until about 1916, when A. C. Fones, of Bridgeport, offered a new idea of education for women to become what he termed dental hygienists. We are all more or less familiar with the successful result of his experiment. It is of interest to note that, although the first classes were trained for special public school work, so many hygienists were employed by dentists that their number was insufficient for the original purpose.

I believe the first law for the regulation of the dental nurse was introduced in the Connecticut Legislature in 1907. This bill was passed.

The first real official suggestion regarding the legal status of the dental nurse came from H. S. Seip, in 1914, when president of the Pennsylvania State Dental Society: "Owing to the mighty movement of oral hygiene I recommend a change in our dental laws, so as to provide for the licensing of the dental nurse. . . . Similar courses of instruction could be provided by the dental colleges, and the services of the nurses utilized while they are taking the course at the chair, as the services of the medical clinic at our different hospitals."

As a matter of record, I wish to take this opportunity to pay honor to one pioneer in this work. Mrs. Irene Wood, who gave prophylactic treatment for many years in my office and was, as far as I have been able to learn, the first dental nurse in the South. She served a large class of appreciative patients, and was the recipient of many

[The House of Delegates, at the 1922 Session of the American Dental Association, passed a resolution advocating uniform state laws for the training of dental hygienists. These laws have been passed by twenty-six states, and Hawaii. There are nine universities and two dispensaries offering courses for the training of dental hygienists.—*Editor.*]

invitations from adjoining state dental societies. If we could be assured that the future dental hygienist would be possessed of the rare quality of loyalty and efficiency of some of these pioneers, there would not be any problem as to the advisability of women doing prophylactic work.

With this beginning, the idea became more popular, until it has spread to the present large proportions. The new name of hygienist became generally accepted, and hundreds of women all over the land are doing this work, more or less successfully. About twenty-six states now have laws regulating their work, and about ten standard training schools for their education. They have their own associations, and you have only to look at the prominent part they are to play at this meeting to see the great change which fifteen years has brought about in the attitude of dentists toward the dental hygienist.

In speaking of this change of attitude in the profession, it will be of interest to note some of the prophecies indulged in nine years ago. Dr. Fones said, "We (dentists) must have aid, and I believe the ideal assistant for this work to be a woman. . . . I think she is better fitted for the position of prophylactic assistant than is a man."

Note that this was written by Dr. Fones before he launched his now popular idea of the hygienist.

A. H. Merritt, looking into the future, wrote: "It is one innovation that has been made necessary by the evolution of dentistry. It is in line of progress and will prevail—progress has always been made in the face of opposition."

T. B. Hyatt said, "Dental nurses will be of inestimable benefit to the public, our patients, and the uplift of our profession, and all good men should write, and think, and work out the best and safest plans for its accomplishment."

One of the first men to employ a dental nurse was Dr. Ebersole of Cleveland, who wrote me in 1914: "This is the beginning of the ninth year in which I have employed ladies in this field."

A prophecy of Dr. Kirk, by editorial, in the *Dental Cosmos* reads: "Whatever objections may be urged against the employment of the dental nurse in this capacity here under consideration, the trend of the times appears to be inevitably in favor of such a course, and it is highly probable that the near future will see the dental nurse so firmly entrenched in her field of activity and as efficiently serviceable there, as today we find the usual lady assistant in our modern dental office."

The war of discussion went merrily on, with the firing line bombarded by the opposition with objections which can be condensed under their cry that if the work was so important, it should be performed only by a dental college graduate, and that many of these young women might "start dental offices of their own."

The objections first raised do not seem to have materialized but new dangers have actually appeared, and it is to these that I wish to call your attention and direct your discussion. One of the greatest problems the hygienist presents lies in the fact that, as experience has shown, about the time she gets things well in hand, she may leave for some reason.

Although I have had long and varied experience in the employment of dental hygienists, and although I have educated the majority of those now

practicing in several southern states, I wished to cover more than my personal experience, so sent out a questionnaire, and on the replies received, the following pages of this paper are based. The letter was addressed to Georgia dentists in particular, and about 100 (at random) over the United States. The questions asked will be taken up, one by one, and a composite summary will be given of the answers received.

Question 1. Are you in favor of the employment of a hygienist? Why?

The replies received were mostly from those favoring or employing hygienists, so I am at a loss to appraise the sentiment of the opposition. Only three replies were in the negative. Among the answers received were the following:

"I never had one and don't like the idea because I think the dentist should do the work."

"Because they are a necessity and becoming more so."

"Because they fill an indispensable place in the modern dental office."

"Can do without."

"Can't do without."

"I favor the employment of a dental hygienist for the very good reason that she would do prophylaxis work better than I, and render the patient better service. A man in full practice, unless he specializes in this branch, usually puts off the cleaning of the teeth until the last thing and then rarely or never gets to it."

"I am in favor of the employment of dental hygienists because, through them, a time consuming branch of preventive dentistry can be done at a low cost to patients. Without them, it would not be done by the dentist, who could not afford to do it any way at a popular fee."

"Yes, because if the teeth can be kept perfectly clean and gum conditions normal, there is less chance of dental caries and the health of the patient is guaranteed."

The reply of Paul Stillman is of more than ordinary interest. He says: "I do not employ a hygienist but believe they are useful in the office where periodontia is entirely neglected."

In the introduction of this paper, we quoted a prophecy by A. H. Merritt, written some ten years ago. Let us see his present position. His answer to the question is as follows: "I have never employed, and never shall—a dental hygienist. I approve of them, and did everything I could to have them legalized in this state (New York), not because it was an ideal solution of an unfortunate condition, but on the ground that half a loaf is better than no loaf. Because the dentist does not keep his patients' teeth clean, and regards it as beneath his dignity to render such service, it was better to train one to do it rather than to let it go undone, as was the case."

Question 2. Do you consider the employment of the hygienist of real value to your patient from a preventive standpoint?

Answers from several were to the effect that the dentist should have done all this work and that it would have been done better had it been so done. Another "saved time and expense to the patient." My correspondents did not seem very enthusiastic over their real results.

Question 3. Are they an asset or a liability from a financial standpoint?

Several answered, "liability;" others "small asset," "about neutral," "about

paying their way and that is all." "I think they are valuable as practice builders, however, and offset in this way any lack of direct money making power for the office."

From these replies, we may be assured that the advertising office won't fall for the idea just yet.

Question 4. What is the longest time of service one has stayed in your employment?

Kirkland heads the list with twelve years. The others gave averages of from one to five years. Most of them changed position from every six months to one year.

Question 5. Where did they get their training?

The majority, of course, came from such institutions as Forsythe and Rochester, but I am constrained to believe that the largest and most satisfactory service rendered by hygienists was by those trained in private offices. (Please note that the long term hygienists were trained in the office where employed.) This is easy to explain; for the dentist would not have trained her unless he was interested in the question; nor would he have trained this girl unless he believed her to be the best obtainable material. She knew and understood the dentist's patients better than a strange girl coming in and taking up the work. On the other hand, the institute trained girl generally lacks the previous years of office work that the private trained girl has. She often has to go to a distant city among different people and does not stay long.

Qestion 6. Do you pay a salary or commission? What is your average pay?

The highest salary reported was $50.00 a week; lowest $35.00 a month, and average, $25.00 a week.

"The commission idea is likely to run riot."

"The bonus for extra production is good."

"No one will tell you the truth, and why ask? I have tried to get the truth but can't."

Those who used the commission plan of payment reported all kinds of troubles. In order to increase their pay checks, the hygienists solicited patients among their acquaintances, and brought in other dentists' patients, which often caused hard feelings. Often they solicited patients not desirable for the office in which they were employed. It is true that such practice caused several dentists to keep a higher grade hygienist than they otherwise would have kept; however, the inevitable result was trouble.

In one case reported, a girl ran her commission up to $500.00 for one month. She soon became officious, and refusing a fair salary, was dismissed, and is now working for another dentist for $20.00 a week. Beware of the commission plan of payment. Under the salary system, the hygienist does anything needed about the office when not busy, and directs her activities and interests as her employer desires.

Question 7. What is the average charge for her operations?

The minimum reported was $2.00; highest, $10.00 per sitting, and average, about $5.00.

Question 8. What percentage of her work do you personally oversee?

Be it to the credit of those now employing hygienists that they are practically all giving personal inspection to the work done by their hygienists.

Question 9. What limitations do you place on her work?

This is governed in many states by legal enactment. However, the situation is not clear as expressed by Harold DeWitt Cross, director of the Forsythe Infirmary, who says: "In many instances so limited that the best service cannot be rendered." A correspondent from New York says: "In this state, the hygienist is legalized to clean exposed surfaces of the teeth only. The more important work of exploring the gingival crevice, which should be done in every case, especially in adults, is left undone. The employing dentist camouflages his indifference to, or ignorance of, diseases affecting the periodontium by turning the patient over to the hygienist. At best, the situation is far from satisfactory."

However, I have never heard of any legal prosecutions for violation of the limitations given the hygienist, although I know that they are daily exceeding their legal limitations. I was last year called as an expert witness in a case in which a dentist was suing a patient for a $100.00 fee in a pyorrhea case, the operation having been done by a hygienist. I refused to testify, and was upheld by the judge. I know of a case in which a hygienist gave a clinic on pyorrhea before her dental assistants' association, which was supposed to be fostered and looked after by a committee from a leading dental society. I have never heard of their extending their activities into the field of fillings or prosthetics.

However, several of the answers may be prophetic: "I believe that the hygienist's work is a part of periodontia and should be so considered." Another dental educator goes even farther: "Does emergency treatments for relief of pain, such as removing, cleaning, and placing eugenol on aching pulps, washes out sockets, removes stitches, and administers dental anesthetics." And still another says: "Removing tartar below the free margin of the gum." (And yet no law allows any such practice.)

Question 10. What other work in the office is her duty?

Strange as it may seem, few dentists have enough prophylactic work to keep a hygienist busy. The proper combination seems to be afforded in an assistant who is a hygienist, bookkeeper and stenographer, her office adjoining the reception room so that all duties can be handled to advantage. The institution trained girl is at a disadvantage because she does not want to do other things in the office, when at leisure. I think the various dental hygienists' associations are making a serious mistake in impressing on their members that it is beneath their dignity to clean up their rooms or do assistant work in the office.

Question 11. Do you consider it unethical for them to solicit business from the practice of other dentists? If so, what do you suggest to regulate this practice?

Question 12. When they make a change of location to practice, should they confine their work to the patients of their new location, or have they the right to take over the patients of their former employer? In other words, do you consider the patients under a dental hygienist theirs, or do they belong to the dentist operating the office?

These questions are so closely related that they will be handled together. Almost everyone answered Question 11 with an emphatic negative, and yet they acknowledge more or less trouble when the hygienist gets business outside her employer's practice. One says, "These two questions are too foolish for anyone to take up time answering." Yet, in

this dentist's city, there have been some of the most flagrant violations of the ethics underlying these foolish questions. In one instance, a hygienist, who had been for years with one of the older dentists, became so impressed with her own importance that dismissal was imperative. She was employed at once by a dentist who, at that time, did not do prophylactic work in his office. The first dentist became sick about that time and was unable to secure another hygienist. His former employe, by visit and telephone and other questionable means, secured about two-thirds of his patients for her new employer. A large portion of a practice which it took half a century to build up was, in a month, swept away because their care had been entrusted to a hygienist. This is liable to happen in any office if the hygienist is given full sway, with no control or restrictions.

Such actual occurrences from many cities have been reported, and we cannot avoid the danger by saying these are unusual cases.

Their repetition will certainly prove a death blow to the hygienist unless we ourselves, or their association, can control these unethical practices.

Let us now further quote from the responses to our questionnaire:

One dentist says, "The patient under the circumstances belongs neither to the hygienist or the dentist. The patient has a right to employ whomever he chooses, and if he prefers to follow the hygienist out of the office of her former employer then she has a right to serve him."

From a Northwest teacher, I quote the following: "I am not convinced that an independent prophylaxis practice by a hygienist, which this question suggests, should be permitted. I regard hygienists as first and foremost preventive workers in the schools. A few will be wanted in dental offices where they are extra hands for their employer and will be working on his patients. If they move to another dental office, they leave the first man's patients—however, if patients wish to change dentists because of the dental hygienist, it is certainly their privilege. Some patients will follow the hygienist and it cannot be prevented. They should be considered, however, as patients who have changed dentists because of the hygienist."

A prominent Georgia dentist thus expresses his sentiments: "Would prefer that they be not recognized except as assistants to dentist in whose office employed. You won't be able to stop them from doing most anything if they get independent recognition—not quite as uncontrollable as a powder magazine in Hades—but most."

The dean of a large dental college says: "When a change of location is made, would approve their confining themselves to the patients of the new location; however, should a former patient appear for prophylaxis service, she would be entirely within her right to perform such service. However, she would be duty bound not to do anything which would tend to influence such patients to change their dentist. This opinion is based on the fact that the patients of an office are not referred to the hygienist but to the dentist in charge and naturally belong to his clientele."

Several times, I have taken the liberty of naming the author where the reply was not of a personal nature and the words carried more weight if the

name of the writer were given. With this in view, I again quote from Paul Stillman in answer to Questions 11 and 12. He wrote:

"It is surely unethical for them to solicit work whatsoever. The dental hygienist has no practice of her own. In this state (New York) she is privileged to work under the direction of a dentist in his office and for his patients. In going to the office of another dentist, the same rule should prevail. An oral hygienist who would do what you have suggested she might do could not be other than a nuisance within the dental profession."

Dr. DeLos Hill thus expresses himself: "If this practice continues, it will absolutely ruin the cause of dental hygienists doing their line of work. They get their practice from the dentists and their operations should be confined to the practice of the dentist by whom they are employed. Patients coming under the observation of a dental hygienist do not belong to the hygienist at all and never will unless the hygienist sets up an office for herself entirely removed from any regular practitioner—under these conditions I think it would be absolutely ethical for them to get business from whatsoever source they could."

A dentist who has employed a hygienist for years and is familiar with the situation says: "I don't allow such practice if I know and can prevent it, but most of them do it anyway."

Maybe the following answer received is right: "Placing the cards on the table—no dentist has anyone he can call his patient after he has finished his job then in hand—the patient has a perfect right to go where he likes."

Believing these questions to be important and because each respondent gave more attention to them, I have given the foregoing quotations considerable space, hoping that the presentation will be of some value to those who have never employed a hygienist and those who have wished information on these questions.

The entrance of the hygienist into practice has brought up some interesting problems. A dentist who is an expert in prophylaxis wants to do this work himself. However, in his city, there are a dozen good hygienists who charge from $2.00 to $5.00 per treatment, and he cannot compete against these low fees. In such cases, the skill of an expert is put on the level with that of the hygienist, and the public is certainly the loser.

All these problems are more or less concerned with the legal status which we give the hygienist. The insertion of a law clause for revoking her license is useless—for no one is going to prosecute her, and certainly not for minor infractions of our ethics. Those states which hold the dentist employer responsible for the hygienist seem to be advocating the only method by which the situation can at present be controlled. Certainly it is not difficult to foretell that, in no distant future, the hygienist will be considered an independent practitioner controlled by laws of her own making, her association having its own boards of control and the association members competing among themselves for business. I am constrained to believe that when this does come about we will be relieved of one of the most serious problems which has confronted the dental world since the "rubber patent" days.

CONCLUSION

By inheritance from my father and through contact with the leaders of preventive dentistry, I have acquired the greatest devotion to the cause and have given twenty-five years' service to the work. I would rather render prophylaxis service than any other branch of dentistry.

In my office, I have employed the highest type of hygienist, and while we have done more work, I know it has not been done so well as I could personally have done it, and for this reason I have always been against the movement. I have always believed that had the dental profession given *proper* attention to this branch, there would not have been any hygienists.

However, I bow to the inevitable and hope the future will see hygienists better educated and with a full knowledge of ethics, working always in cooperation with us. I trust that it may work out for the best interest of the profession and the public. Woman has always been our inspiration and help, and I believe that in this field she can eliminate the objections now existing and become one of the crowning features of the dental profession.

DISCUSSION

Benjamin Tishler, Boston, Mass.: Those of us who are at all familiar with the practice of oral prophylaxis realize that the status of the dental hygienist is becoming a serious problem in many ways. That she is capable of occupying a proper place in dental practice is unquestioned since there is ample room for her activities, provided, of course, such activities are confined to the sphere in which she is best fitted to operate. We all know that the laws of the various states in which she is licensed to practice clearly define her limitations, but despite this fact these limitations are constantly ignored and exceeded. The exact proportion of those who are guilty of these transgressions is not definitely known, but the unpleasant condition has become more and more apparent as her numbers increase. I am aware from personal contact with both practitioners and hygienists that abuses of the legal privilege accorded them are not uncommon, but I must confess my amazement when I read Dr. Adair's substantiating statements with facts. As I read the accounts of questionable dealings, abuses of confidence and the disturbance of office discipline, which appeared to be so general, the thought came to my mind "Where does the fault lie? It is true that these abuses exist, but who is responsible and are they practiced by the profession as a whole?" While I hold no brief for the dental hygienist as such and possess no information which would lead me to believe such a condition to be existent, I cannot believe that the many instances cited by Dr. Adair represent the great majority. During the past three years, I addressed two meetings of dental hygienists. At the first, I was surprised when told by one of their number that she practiced the correction of traumatic occlusion by grinding the occlusal surfaces of teeth, an operation which taxes the skill of experienced dental practitioners. At the other meeting, I was asked to explain my method of treating cases of Vincent's infection, a question which I parried by inquiring whether it was the custom for hygienists to treat cases of this kind. Much to my surprise, there were affirmative replies from all parts of the room. Now who is fundamentally responsible for these abuses? Let us try to analyze the situation and endeavor to place the blame where it rightfully belongs. When a dentist employs a hygienist, he does so for one of two reasons, either because he honestly needs her assistance in her chosen field or because of the advertising and supposed prestige that it will bring him. Now right here there appears a sharp line of demarcation between the honest man and the semi-advertiser. The honest man will not countenance the abuses to which we have referred because his nature will not permit it. The other type is indifferent to many things provided financial returns are adequate, and it is employment of this sort which encourages the hygienist to exceed her legal limitations. On the other hand, many honest men employ a hygienist because they dislike the process of cleaning teeth and are not really interested, as Dr. Adair has pointed out. As a consequence, they pay no heed to the activities of the young woman, who often has an inward contempt for the man who employs her, because

she feels that she is superior to him in the knowledge of matters pertaining to oral hygiene, a subject which she has been rightfully taught to believe is of paramount importance. I have heard the statement made on good authority that hygienists have said that no dentist can properly clean teeth, and the attitude of some substantiates this belief. Because of the neglect by the one kind of practitioner and the encouragement given by the other, I consider that the burden of responsibility should be placed not only on the hygienists but on the practitioner who employs them. I consider further that the latter bears the greater responsibility and is more at fault, for no employe will dare to defy the authority of her employer if she feels that he is in earnest and properly understands the situation. The average dentist, whether he is of the honest or semi-advertising type, is usually so pleased to be rid of what he considers an unpleasant and unimportant task that he does not bother to supervise the work of his hygienist, which is often poorly done. I have knowledge of one who worked for two practitioners at a fixed salary of $5.00 per day. This young woman accommodated as many as three patients an hour, one every fifteen minutes, allowing five minutes for the disposition of instruments, etc., between each patient. Any periodontist knows that it is impossible to perform this operation in so short a period. It easily consumes from three quarters to an hour in every case where there is a full complement of teeth, but this young woman, a recent graduate, finished it in one-third of the ordinary time—an impossible accomplishment and one that is sure to hurt the cause of oral prophylaxis. Any dentist who will allow this kind of service is just as guilty of malpractice as though he performed it in person. It is not to be inferred from this that I consider the dental hygienists who practice the abuses which we are considering innocent of any wrong. These young women, most of whom are intelligent, are well aware of what they are doing whether the operation is a poorly performed prophylactic treatment or one which was not included in their training. In assuming these tasks, which are rightfully those of the dentist, and thinking that they are capable of performing them, these young women show the truth of the adage that "a little knowledge is a dangerous thing." There may be another factor which should share some responsibility. It would seem that the dentists and the institutions which train these young women may be somewhat lax in stressing their limitations and the question of professional ethics and honor. It is well known that in some schools there is a great deal of mental chafing among the faculty, because of the restraint which the laws of the various states place on them and the question of enlarging the field of operation of the hygienist is under discussion. One university, to my knowledge, considers that apoxesis is a natural field for her and seriously contemplates its inclusion in the curriculum. As the school in question is a class A institution and the entire field of periodontology would have to be considered, should this be seriously undertaken, it would necessitate the thorough study of biologic subjects such as anatomy, physiology and pathology, and thus increase the period of training. That this is a step in the wrong direction cannot be denied. To train young women in these important subjects and expect them to render proficient service to their patients is to anticipate the impossible, when one considers that the average length of service in a single position varies from six to twelve months as was brought out by Dr. Adair's questionnaire. Apparently, their duties rest lightly on their heads, and those practitioners who are interested in periodontia and are trying to convince the profession at large, through their writings and results obtained in practice, that suppurative periodontoclasia is a curable disease if properly treated have enough difficulty to do so without an added burden such as this. I believe that recognition of the importance of the following will help to clear the situation:

1. Education of the dentist to a sense of duty to his patients and a knowledge of the prime importance of oral prophylaxis.

2. Education of the dental hygienist, with strict emphasis during her period of training on what constitutes dental ethics and dental malpractice.

3. The revocation of the license of any dental hygienist who is found guilty of exceeding the sphere of her legal limitations.

4. The revocation of the license of any dental practitioner who allows a hygienist to exceed her legal limitations.

The enforcement of these four conditions would automatically (1) cause the dentist to give the proper place in his practice to the careful cleaning of teeth and massage of the gingivae; (2) regulate the conduct of the hygienist; (3) help to make them careful as

regards infringement of their authorized duties, and (4) compel the dentist to inspect all operations completed in his office by the hygienist.

A. J. McDonagh, Toronto, Canada: I come from a country where we have no hygienists, and am consequently in a position to look on the subject from an independent standpoint. In Canada, we have the dental nurse who is trained to assist the dentist at the chair, to look after his accounts, to do his stenographic and roentgen-ray work, and numerous other duties, but is not trained to do prophylaxis, nor is she expected to take care of a patient independently. We evidently have had the same fear of the dental nurse's overstepping her duties as you have had regarding your hygienist; consequently our college has perhaps been a little conservative in dealing with the dental nurse. On the other hand, when you license a young woman who has had but one year's training to do work which she is likely to enlarge on to a certain extent, it appears that you have not been conservative enough. Let me state the conception I have of the situation and I cannot say that I will be borne out by all my fellow countrymen. The legislature of your state and of our Province of Ontario gives you a license after you have been thoroughly trained to practice dentistry for the benefit of the public. That license is issued, giving you special privileges and protection because it is considered that it is for the benefit of the public, and college training is demanded because of the same reason. Therefore, it is your duty to render to the public the best service you are capable of, and the public believes that it is paying for a highly trained specialist who is doing something that the ordinary individual is not capable of doing. Consequently, according to the locality you live in and your environment you are demanding a fee of from $5.00 to $30 or $40 an hour, but if you are doing that which a less trained individual can do as well as or better than you can, naturally you would feel that you have no right to charge those fees for that work, and as a result you spend some time training a young woman to do what we are pleased to call prophylaxis. I have seen young women engaged in this work who had not had an elaborate amount of training, other than their experience, and who could do better work than nine-tenths of the dentists whose many and varied operations prevent them from paying special attention to this line of work. Therefore, is it not the honest thing for dentists who have not the training or the time or the aptitude for this work, to transfer their patients to the more expert young lady? The importance of keeping the surfaces of the teeth clean and free from accumulations which harbor microorganisms and cause irritation of the gingival margins is not realized sufficiently by the public or generally by the profession. Furthermore, is it not honest that such a dentist employ a person who will teach his patients by word and example the importance of keeping bacterial growths and injurious accretions removed from the surfaces of the teeth? Are we afraid as dentists (to use a common expression) that we are going to lose some business by employing a young lady to do that which we are inadequately doing or perhaps not doing at all? According to Dr. Adair dental hygienists are licensed to do certain work, and it is difficult to draw a line as to where that work begins and where it ends. In Ontario, there is no such license, but there is no law in Ontario, or I believe anywhere else, which will prevent a trained nurse either medical or dental or for that matter which will prevent any other person from cleaning the teeth of any person who is willing to have his teeth cleaned. Then why the necessity of a license? Every mother, in all well regulated society, will clean the teeth of her young children. Every medical nurse in a good hospital is trained to clean the teeth of her patients, and regularly performs that office. Then why not a dental assistant? Is it not justice to the public that she do it rather than that the patient be forced to pay for the time of the dentist? Were the foregoing the common practice, there would be no difficulty in stopping an untrained person from performing dental operations, and every patient would have his mouth prepared for the operation of the dentist by an assistant, as now every patient has his body prepared for the operation of the surgeon by an assistant or nurse.

Let us consider the orthodontist, who is a highly trained specialist, and who must necessarily charge high fees for the work he does, so much so that many parents cannot afford orthodontic work for their children, and it is not only just that the necessary expense be kept as low as possible in this case but also imperative. On account of the apparatus used by the orthodontist, his patients will need to have their teeth and their orthodontic appliances cleaned a great many times, and

although it does not require the skill of a dentist to do it, it does require patience, intelligence and appreciation of the work, which qualities, to my mind, instinctively belong to women. If an intelligent woman assistant cannot polish the surfaces of the teeth without injury, or if it is wrong for the dentist to employ one to do such work, then she cannot wax up a case, polish a crown or buff a denture. True, you may say, one is in the mouth and one is in the laboratory away from the patient, but from my experience and what I have seen of the work done, such an argument is nothing more than an argument. From the standpoint of honesty, the dentist who delivers the best services to his patient is the one who does only that which he is best suited to do and who apportions to some other person the work which that person is better suited to do than he is. And he is not honest if he charges his patients a high fee for work that does not require extra skill or extra training. And he "gets away with it," to use a common expression, because his patients have no way of finding him out. Let me say that the laws which are made to protect the dentist only and not the public, are unjust laws and should not be tolerated by intelligent people. It is necessary, therefore, to have a clear conception as to where harm can be done to the public by uneducated operators. In this connection let me draw your attention to what I consider a serious oversight on the part of many operators, as it is not realized that any break in the cementum or the enamel which will expose the dentin and which is caused by instrumentation is a serious menace to the health of the patient. Let me repeat here what I have said time and again: Microorganisms can find ingress into the dental pulp through exposed dentin (the result of instrumentation or grinding) one hundred times more easily than they can through a break in the cementum or enamel caused by decay, because, in one case, there is no adventitious or secondary dentin formed and, in the other case, there is secondary dentin formed in the pulp chamber or pulp canal and that normal dentin has 100 times as many canals passing through it according to Dr. Boedecker, as has secondary dentin. Therefore, it seems but reasonable to expect that an operation performed on the very thin cementum in the gingival crevice should be performed by one who understands histology, pathology and physiology, and who realizes the importance of preserving the normal tissues of the tooth. Knowing these facts, is it any wonder that many periodontists whom I have discussed this subject with view with alarm legislation which will license any one who has not had the training of a dentist to perform a service that may be turned into a surgical operation under the free margin of the gum? The employment of an intelligent, conscientious assistant by a dentist, to do the operation which I understand as prophylaxis and which I have outlined in this discussion, is not only a permissible procedure but, under the circumstances of living today, also an obligation on the dentist; but to establish a separate calling or profession, as has been suggested in Dr. Adair's paper, composed of individuals partly trained in dentistry is, to say the least, a very doubtful procedure, and we in Canada at present have no intention of doing so.

N. G. Slaughter, Athens, Georgia: Every man here that has a dental hygienist is interested in this paper. We all know that a trained dental hygienist is an asset to any office. Another thing is this: The general practitioner that has not a dental hygienist (I am talking about most of them) does not do prophylactic work in that office. We have a duty to humanity—we heard that from Professor Sutton last night and Dr. Hartzell this morning. By the employment of a dental hygienist, we can do more than in any other way that I know. We can see more patients, and at a more reasonable price for those that cannot afford to go to a man when it would cost them ten dollars an hour and up. The dental hygienist, with that wonderful technic a woman has, can do more good for humanity than we can do ourselves. I believe her employment is going to be one of the greatest things we can do for our patients, and our community and it will be an uplift to dentistry in the long run.

H. G. Morton, Milwaukee, Wis.: The questions in the questionnaire reflect not on the hygienist but upon the morale of the dental profession in answering those questions. We employ hygienists in our office and we have no such conditions as some of the questions in the paper conveyed. I cannot understand how anyone in the dental profession can be so blind to their possibilities as to not see that they can afford to hire a hygienist and not have her take one cent of fee from the patient and then be miles ahead of the other man. The hygienist reflects entirely the character of the man who employs her, and

I say to you, gentlemen, that if you will conduct your practice with the thought in mind that that patient will be a patient of yours just as long as you live, and if you have that thought, you don't have to charge a fee for a hygienist. She will do the work and bring you the fees, and she will merely reflect you. We cannot get along without hygienists, and unfortunately we cannot educate the dental profession to see the need of having more of them in their practice.

W. S. Locke, Cincinnati, Ohio: I believe the dental hygienist is needed. I think they are of great value in an office. There is no question about that, but I see no reason why they should not have a dentist's degree. They have no more right to practice on the human being than the osteopath has without a medical degree. I really believe that they should have a degree, because you cannot draw the line as to where they shall stop. I watched one of the operators over here. She was not doing prophylactic work. She was performing surgical operations, and I called her attention to that fact. I feel that the hygienist should have a degree of dental surgery, and then she would have a right to practice. They should not treat the patient; they have not the right under the law, and all they should do is to follow the dentist's orders.

T. E. Purcell, Kansas City, Mo.: The gentleman who just spoke makes the same mistake in my estimation as the dental profession is making. How are you going to get dental hygienists if you are going to make them have dental degrees? Why would they limit themselves to dental hygiene if they have dental degrees? We have the question up in Missouri at the present time of having a law licensing the dental hygienist. The question, as Dr. Slaughter said, is an important one. It is an important thing that we have the prophylactic specialists. The dental profession today is making the same mistake that the medical profession made a good many years ago. They are becoming specialized so fast, and specialists *per se* must necessarily have a high fee for their work. You cannot give a woman a dental degree and have her remain a dental hygienist. At the annual meeting a year and a half ago, a suggestion was made that the man who practiced dentistry in the future must be a supereducated man, that he must have as his assistant a university graduate, and I would like to know why a university graduate would work for a supereducated man. They have a law in New York under which the dental hygienist is allowed to clean teeth above the free margin of the gum. There is nothing to clean. They don't do prophylactic work above the dental margin of the gum, and we have this to consider: In every state, the legislature controls the law as to the practice of medicine. In Missouri, the osteopath and the chiropractor are practicing medicine, and the medical practitioners were blind to the fact that they could not control them. At the last legislative meeting in Missouri, they tried to get through a law eliminating the practice of these men, and they could not touch the legislature. It is made up of one-fifth farmers and four-fifths attorneys. Let the legislators combine and they can get a law passed and do plate and column bridge work, and the dental profession can't stop them. We are blind to the fact that we can now control this situation. We ought to control it now, pass laws and control the laws of the dental profession, license these women and their work in the licensing. If we don't do it now, the time will come when we can't stop them.

H. G. Tanzey, Kansas City, Mo.: I think that those who operate in the orifices of the body are called specialists, as a rule. If you are operating on the eye, the ear, nose, throat or mouth, or any of the orifices, as a rule, you are a specialist, and a specialist is expected by law to know more about conditions coming under his specialty than the general practitioner does, and it is my opinion that the ability of any one operating in one of those orifices should measure up to the expectations of the law. They should at least have a dental degree. If any hygienist in my office or any other office operated on the eye, ear, nose, throat or mouth, she should at least have a pretty good education, and, I think, a degree, and I don't think there is any one in my hearing that can deny that, and I don't believe you can legislate against it.

Dr. Purcell: I will venture to say that five years hence the dental hygienist will be practicing in this country without legislation, just as the osteopath and the chiropractor are doing now.

Thaddeus P. Hyatt, New York City: It was because the profession did not clean teeth that the position of assistant or dental hygienist has come into existence.

In regard to what Dr. Adair has said, I am thankful that he has brought up these dif-

ferent points. I would ask him to remember that most of the problems related are problems of human nature, not of professional work or technic. I have heard, and I am sure you have heard, of bank cashiers running away with a lot of money from the bank. Have they abolished bank cashiers? A lack of ethics is sometimes present in human nature, and as one speaker has already stated, the character of the dental hygienist but reflects the character of the office where she works, but the greatest value of the whole movement lies in the fact that one dental hygienist can take care of 1,200 patients a year, and one dentist can take care properly of only about 400, and you can have dental appliances, machines and so forth, in public institutions, industrial institutions and public schools, teaching, educating and giving practical demonstrations of the value of mouth hygiene.

Dr. Tishler: When I read Dr. Adair's paper, it did not occur to me that he was criticizing a hygienist as a hygienist. He was criticizing the abuses of the hygienist. I do not think it is a question as to whether the hygienist is efficient, or whether we need her services or not, but merely a question of curbing her pernicious activities. I think the time has come when some effort should be taken to curb her. Many hygienists are ethical and law abiding, and many are not. To allow the latter to continue their practice is wrong, and the time has come that something should be done. I think we should discuss that point rather than whether or not a hygienist should have a degree, or is capable of filling the office she is occupying. We should do something active to prevent these young women from doing the things that some of them are doing.

Dr. Purcell: The state must do that.

Dr. Tishler: I do not deny that, but something active should be done.

Dr. Adair (closing): The dental hygienist has no better friend than myself. Those who have come in contact with me in educational work will certainly bear that out. I do not want this paper to be taken at all as an attack on the dental hygienist, but in some way to point out to you men who have not experienced trouble the best way to eradicate some of the problems which come up in the way I have suggested. It is true, as Dr. Hyatt says, that it is a case of humanity and personal equation, but it is also humanity you are working on. A law is unnecessary. If I were a dental hygienist and wanted to go into any state, whether it had a law or not, and had the money to fight my way, I believe that I could practice. What is a hygienist for? Some of you men, from the discussion I have heard outside, want them for periodontists. That I am absolutely opposed to. But, if you want them as hygienists, as we men who are interested in this work define it; i. e., to clean the teeth of the patient, that is a different proposition, and a hygienist who will go into the office without instruments and teach that patient a method of brushing the teeth is doing a good work, and no one will say anything in criticism of her work. If she does unethical things, she deserves criticism. Your laws say in some states that she shall not go beneath the free margin of the gum. That is foolish. I would not have a dental hygienist that could not clean a set of teeth. I want her to do all she can, but the minute she gets into a pathologic condition, I want her to have sense enough to stop. As Arthur D. Black said yesterday, the only good teeth are grown prenatally and taken care of up to the time of complete calcification. You don't let an untrained girl teach mathematics, geography and so forth, and yet you would allow her to take care of patients' dental education and their teeth. I am absolutely opposed to any untrained girl taking care of the growing teeth in this country. The hygienist has a wonderful place and work, but she should be trained and educated. She can control the patient, or young child, better than I can; she can teach it to use the toothbrush, but that is as far as she should go. She should be taught something of the ethics of the dental profession.

DENTURE CASTINGS FROM AN ENGINEERING STANDPOINT

By F. E. ROACH, D.D.S., Chicago, Illinois

(Read before the Chicago Dental Society, Oct. 20, 1925)

ABOUT seventeen years ago, dentistry and the world were made the recipients of a definite standardized technic for making castings of gold. Since that time, there have been a great many modifications and variations in detail, but in the main the principles laid down at that time have been very generally adhered to.

Having made a great many experiments with all known means, methods and materials, I have, after years of research and experimentation, come to the conclusion that, as far as inlay technic is concerned, there has been no material improvement. The casting technic that I am about to give you is fundamentally the same as that given by Dr. W. H. Taggart, on that eventful night at the old Palmer House, in February, 1907.

While the casting process has practically revolutionized operative procedures and has almost, if not wholly, supplanted swaging and other means of constructing partial dentures of both fixed and removable types, it has not met the requirements for full denture construction with the same degree of success. Beyond a brief outline of the Nunn technic, the discussion of this phase of the subject will be left to Dr. Rupert E. Hall.

It is my purpose at this time to discuss some of the engineering problems involved in the construction of gold partial denture of the removable type, and to introduce to you a new casting machine and some rather unique principles in removable partial denture design.

The term engineering seldom appears in dental literature, and in order that my position may be better understood with reference to its use when applied to dental procedures, an explanation may be necessary. Webster defines engineering as the art and science by which natural forces and materials are utilized in structures or machines. In the Standard Dental Dictionary, we find the term dental engineering defined as the art and science by which the mechanical properties of matter are made useful in structures and machines pertaining to dentistry. The determination of the type, or design, of a restoration, and its fabrication or construction, is an engineering problem pure and simple; and, in this connection, may I suggest the use of the term survey or examination instead of diagnosis?

Assuming that gold is the best material for this purpose, what are our problems in its use? Contrary to the general impression, the construction of gold partial dentures is now comparatively simple. With disappearing

plaster for impressions, a strong, smooth refractory investment compound for casts, waxing and casting direct to

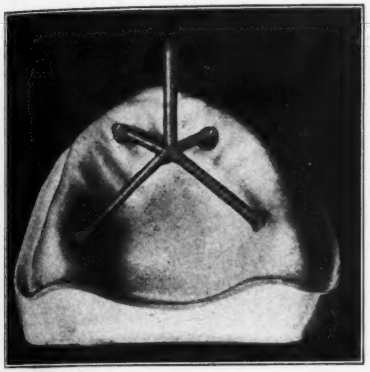

Fig. 1.—Wax pattern with sprue ready for first coating of investment.

model, and a simple dependable casting machine, the construction of gold cases is no more difficult than is that of

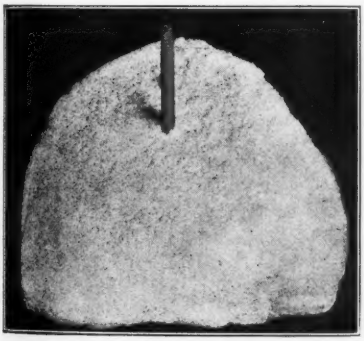

Fig. 2.—Cast with wax pattern covered with first investment and wax sprue projecting to which crucible is to be attached.

vulcanite. As a matter of fact, we have but one serious problem: how to avoid mistakes in structural design. There can be no hard and fast rule governing design. Every case is a law unto itself and so requires individual treatment.

Fig. 3.—Crucible attached to sprue wax ready for second layer of investment.

Fig. 4.—Showing the amount of second investment that is placed around crucible to retain its position during the final investment.

Almost anyone with reasonable intelligence can be taught to build these appliances successfully if plans and speci-

fications are furnished. Many years of close observation and study has convinced me that this is the one big problem.

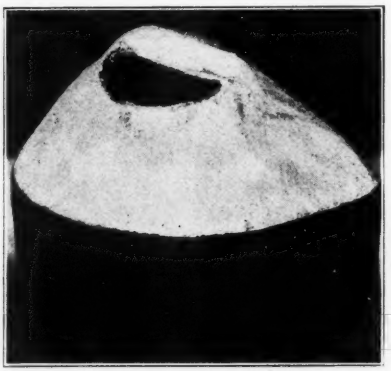

Fig. 5.—Case completely flasked ready for burning out.

Correct design calls for careful study of all mouth conditions; noting

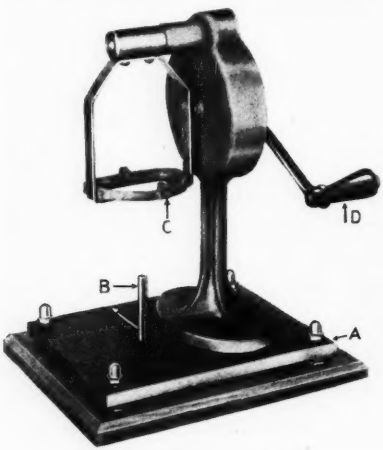

Fig. 6.—Casting machine.

condition, position, contour, number and occlusal relations of all teeth. We must keep constantly in mind the fact that the most damaging and destructive force in the mouth is leverage: we must

Fig. 7.—Finished gold plate and crucible as they come from the investment.

so design our appliances that leverage will be reduced to the minimum. The use of stabilizers and occlusal rests; re-

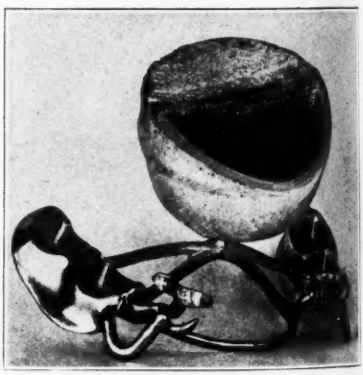

Fig. 8.—A finished one piece casting and crucible as it comes from the investment. (Note the outline of the double bar clasp.)

ciprocal bearing of clasps; accuracy of adaptation; coordination of clasps and

saddles in carrying the load, and correct occlusion are the main factors in reducing leverage.

Gingival impingement and large

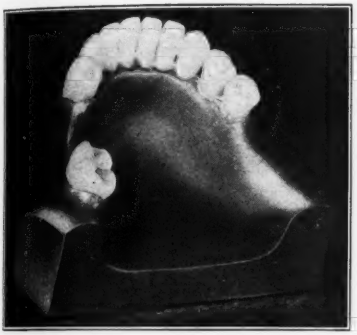

Fig. 9.—A case with a badly tipped molar and bicuspids with excess contour; a rather difficult case for ordinary clasps. The new bar clasp makes these cases easy.

areas of tooth contact should be avoided. The natural teeth should carry the load whenever possible. This

Fig. 10.—Another view of case shown in Figure 9.

of course is not feasible in extension saddle cases. All lingual, buccal and labial bars should be kept slightly away from the soft tissues. Palatal bars should be fitted into close compressed contact with the tissues on both sides of the median line. Gold bases should

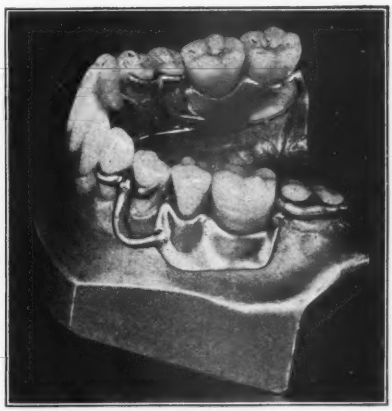

Fig. 11.—A case in place on model.

be used with porcelain crowns wherever possible. When restoration of facial contour and cosmetic requirements are to be met, preference is given to synthetic porcelain. In the larger posterior restorations, vulcanite may be employed.

It is a good rule in structural de-

Fig. 12.—Continuous buccal and lingual bars connecting saddles with bar clasps attached.

signing for partial cases to avoid large bulky masses as much as possible, and to obviate short direct connection of these larger masses by small bars without provision for controlling shrinkage to the two or more common mass cen-

ters. This control is affected by structural design, location of sprues, hot mold, filtered feed of gold into the mold and sustained vibratory pressure during crystallization.

Fig. 13.—Two point bearing bar clasp on bicuspids and three point bearing bar clasps on molar.

The structural designs that I will show you comply with this requirement and, in addition, overcome several of the objectionable features found in the designs that are in vogue today. In speaking of structural design, I refer more particularly to buccal bars and bar clasps.

Fig. 14.—Two double bar clasps with lingual bar and stabilizers.

To make this point clear, permit me to outline the outstanding features of design as applied particularly to the continuous buccal bar and the bar clasp, as follows: first, employment of flexible clasps with a full four point reciprocal bearing; second, substitution of flexible instead of rigid contact of clasp with tooth at its juncture with the saddle; third, avoidance of interferences with teeth having excess contour and that are out of alinement; fourth, smallest possible tooth contact of clasp; fifth, elimination of excess from surfaces of teeth approximating the

Fig. 15.—Double bar clasp supplementing a regular buccal lingual contour clasp for a lower case.

Fig. 16.—Upper case showing double bar clasp on right and a single bar clasp on left.

pontics; sixth, presence of great strength and stability with light construction. In addition, it is practically self-cleansing.

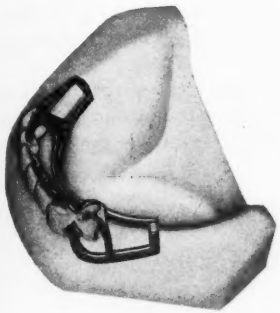

Fig. 17.—Lingual bar with bar clasps, lingual stabilizers and strong truss anchorage for vulcanite.

Alloys of gold, while in a molten state, are very susceptible of contamination with foreign substances such as carbon, oxids, occluded gases and particles of base metal.

We have to contend with many other problems in the metallurgical phase of

Fig. 18.—An ideal type of construction for unilateral clasp bridge.

this subject, but time will not permit of extended consideration here. Suffice it to say that the means and methods of melting and heat treatment are well worth careful study if we are to obtain the best castings.

The casting machine here shown was designed by Dr. F. W. Nunn, of Melbourne, Australia, and, in collaboration with him, we have made some modifications of both machine and technic.

Fig. 19.—One piece casting made in 1909 (a bit of history).

As to the results, we will let you be the judge.

The machine may be described as a vibratory, vertical centrifugal type,

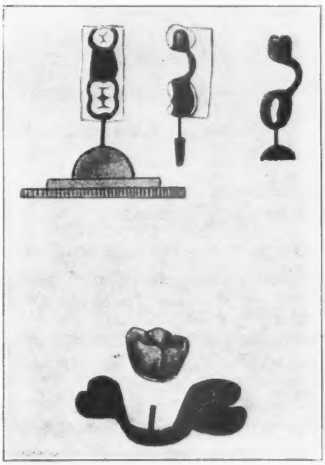

Fig. 20.—One piece casting made in 1917.

operated by hand power applied to a crank attached to a gear ratio 1:5,

which yields a slow, steady speed delivering a low, continuously sustained pressure for any desired length of time.

Centrifugal force, both horizontal and vertical, has been employed for many years, but as far as I know, the type of crucible used and the supplemental vibratory motion are new features.

A crucible so invested that it becomes an integral part of the investment, having openings so small that the gold is actually filtered into the mold; vertical centrifugal force and gravity, supplemented by a vibratory motion, and casting into a very hot mold, are the features that seem to combine in producing the wonderful results we are obtaining.

Metals, in passing from the hot to the cold state, undergo dimensional changes, and these changes may be expressed in terms of shrinkage and warpage. The larger bilateral cases are, of course, affected to a greater extent by these changes than are the smaller structures.

Shrinkage is also a factor in causing weak places in castings that have rather large masses connected by parts smaller in size, such as lingual bar cases and many other types of partial denture design.

Shrinkage and warpage seem to have been eliminated in our present method of casting, and while this minimizes the necessity for sectional construction, there are many of the more complicated cases that are finished more expeditiously by the sectional method.

When making these larger castings, it is well to keep in mind the physical laws governing these changes and either control or compensate for them as much as possible. The founder of base metal castings makes his pattern proportionately larger to allow for shrinkage, and he controls, or at least reduces, warpage by the design of his pattern and the manner of pouring his metal.

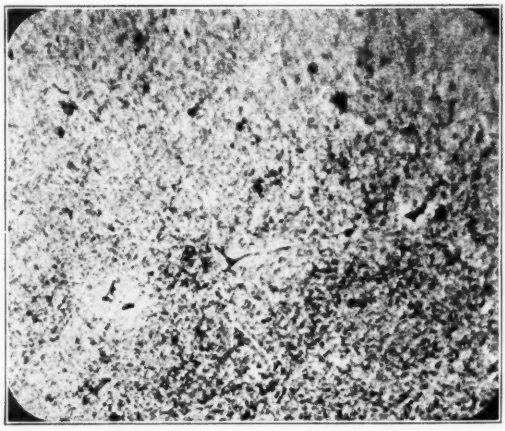

Fig. 21.—Alloy before contamination.

The high heat necessary in making these large castings necessitates the employment of a very refractory investment material, and to meet this requirement, Dr. Louis J. Weinstein has produced a very smooth, hard and refractory investment compound that in every way seems to satisfy our needs.

We are making better castings than ever before. They are smoother, stronger and more dense; show less shrinkage and warpage, and are made in much less time. We believe that our structural designs are an improvement over those of the past; our gold alloys are better suited to our several requirements; and our means, materials and methods indicate progress; but back of it all lies the one outstanding fact that, without the casting process, dentistry would be groping along with methods but little better than those employed half a century ago.

Again I say, all praise to our own William H. Taggart.

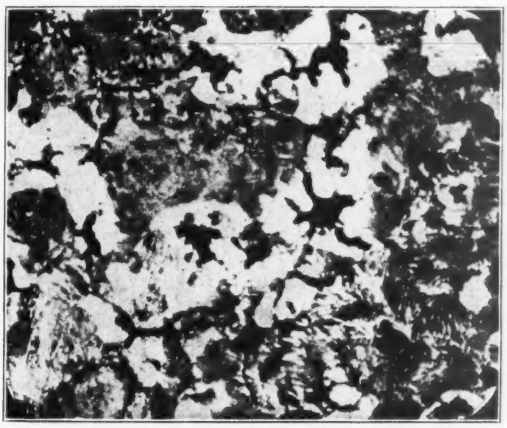

Fig. 22.—Alloy shown in Figure 21, after contamination. (Note the difference in the density.)

DISCUSSION

G. Walter Dittmar, Chicago, Ill.: Situated as I am, in the same suite of offices with Dr. Roach, I have had opportunity to see many remarkable cases in the mouths of patients. Some of these were very difficult and complex, with the result in restoration nothing short of marvelous. Permit me to outline briefly some of the reasons such results were obtained, especially in difficult partial restorations: 1. A careful survey of the dental and oral conditions with especial reference to the position and condition of the remaining teeth; their shape, inclination and possible abnormalities. 2. A careful study of the saddle areas, with reference to the relative condition and density of the tissues, muscle attachments, muscle action, etc. 3. The occlusion and mandibular movements. 4. The habits of the patient with reference to mandibular movements and also the care of the mouth. The survey being complete, the next thing is the obtaining of an accurate impression, in every detail, of the remaining teeth and saddle areas. The sectional impression technic is the only one that can be successfully employed in difficult cases. The cast should be made from a special material that will be smooth and resist extremely high temperature and its expansion under such heat. It should as nearly as possible compensate for the contraction of the metal when

the casting is cold; the casting to be made directly on the original cast (or model). A careful registration of the teeth in occlusion should be made in wax. It is best to take a plaster impression of the teeth in the opposing jaw, and make a metal or artificial stone cast. This and the cast on which the restoration will be made should now be mounted on an articulator. It is here that the structural designing must be done, and great care must be exercised in making the pattern so that it will in every detail meet the requirements of the case. From 28 to 30 gage wax is usually employed, being thickened or reinforced where needed. The steps in this procedure are as follows: 1. Trace the outline of the pattern desired on the cast with an indelible pencil. 2. Soften a sheet of wax with dry heat until it becomes flexible, then lay it over the cast and sprinkle with powdered mica or in the absence of mica use talcum powder. 3. With the fingers, carefully adapt the wax to the cast and burnish the former with a tuft of cotton. Carefully smooth out the wrinkles with burnishing instruments. After the pattern is smooth, lute the edges with a hot instrument, sealing it to the cast. 4. Grind the porcelain teeth to fit, and articulate, then mount them on the wax pattern in a manner to permit the porcelain facings or porcelain teeth to be removed. The wax patterns of clasps or bars of the desired type are also formed and luted to the cast. In some instances, the labial and buccal bars will have to be placed so that they will not interfere when the finished appliance is inserted or removed. Thus, the wax bars cannot be luted to the cast but must be so formed and placed that they will stand away from the cast sufficiently far not to interfere with such insertion or removal, when they are substituted with metal. 5. Place sprues of wax so they will feed the molten metal into the mold to the best advantage. Here, we should remember what Dr. Roach said regarding shrinkage and warpage, and the danger to the clasps and smaller bars due to the contraction of the larger masses of metal on cooling, causing a crystalline and weakened condition in these clasps and small bars. He called attention to the necessity of avoiding large bulky masses of gold because of excessive contraction, also of designing the proper location of multiple sprues to prevent weakness due to faulty crystallization. The investing, eliminating of the wax pattern, drying and heating of the case and the casting have been so well described that I will not take time to discuss these steps.

Regarding installing the prosthetic piece. If proper care has been exercised in every detail in producing the restoration, there will be little trouble in placing it in the mouth, and if it is properly designed and finished, there will be practically no irritation to the tissues. Should irritation and soreness develop, the necessary correction should be made. A patient should never be dismissed without thoroughly understanding the importance of returning to the dentist periodically and having such corrections made as may be necessary from time to time. It is more necessary carefully to examine periodically and correct faulty conditions that may develop to the restored masticating "machine" than to have the machinery of a fine automobile carefully examined and adjustments made periodically.

In casting full or partial restorations, we should always be sure that the alloy of gold used is at its best. In other words we should not use "junk" gold or gold of questionable alloy. This applies to all large castings, and especially to those complicated designs which have lingual, palatal or buccal bars or ordinary clasps or bar clasps. Remarkably dependable casting alloys are now to be had for bar and clasp construction, and such special alloys should always be used fresh. No chances should be taken with alloys that are more or less contaminated or questionable. The slides shown showed clearly the difference between clean, fresh alloys and contaminated alloys. The buccal and labial and lingual bar clasps made in the manner described by Dr. Roach are a new and unique feature. As a means of retaining and stabilizing removable partial dentures in those difficult cases in which teeth have migrated and seriously tipped; the contour of the crowns of teeth is excessive, or there is lack of proper space between teeth, this form of retaining appliance is most effective and has many advantages when compared to the older and more common types of tensofriction appliance. The reciprocal four point bearing of these clasps as explained by Dr. Roach is a noteworthy feature.

In designing the clasps, the most advantageous portions of the teeth for stability of the clasp and the least harmful wear to the teeth should be considered, in conjunction with the placing and removing of the finished appliance. The buccal and labial bars should, as a rule, nicely fit the soft tissues, but should not bear on them to cause pressure. In some

instances, where there is marked prominence of the alveolar process, as in the cuspid region, the buccal or labial bars must be designed to lay away from the tissues far enough to permit the placing and removing of the appliance without injury to the soft tissues. What would seem to be an objectionable feature to this type of bar and bar clasp is that they would trap and retain food and be hard to keep clean; but patients seldom, if ever, complain of this. There can be no question that where they are indicated, as was previously explained, they form one of the most efficient retentive and stabilizing devices that can be employed in removable partial denture construction. In the construction of these large and complicated partial dentures with their several bars and clasps, it is usually the best procedure to make the appliance in two, and, at times, three, sections, which, after they are cast, should be nicely fitted in the mouth of the patient and an impression taken in plaster, then the different sections soldered together and the case finished. This is the procedure originally taught by Dr. Roach, and one that has some decided advantages over the one piece casting. However, the wonderful results obtained with the technic and casting device given to the profession by Dr. Roach and Dr. Frederick W. Nunn of Melbourne, Australia, and the great improvement in certain investment material has made it possible to make large and complicated castings with wonderful accuracy. Dr. Nunn brought to us some new and practical ideas. He deserves to be credited with contributing materially to the success of full and large partial denture castings, which, if made according to the technic followed by Dr. Roach, will give most gratifying results. I too, voice my great appreciation for what Doctor W. H. Taggart did for our profession and for humanity when he gave us this wonderful process for making dental castings of all kinds. Think for a moment, those of you who were in practice before that eventful evening in 1907, think of the toil, drudgery and discomfort entailed in the high class reparative and restorative dentistry of that time, and compare it with the wonderful and beautiful results of today, which are produced so easily and accurately. The quality of our service, more especially in the prosthetic field, has improved beyond any thing dreamed of twenty years ago. This evening's program has dealt more in particular with the production of castings in the prosthetic field, and to no man in the profession is greater credit due than to Dr. Roach, in applying this process to the improvement of dental prosthesis.

W. Izott McNeil, Chicago, Ill.: In considering the one piece casting, care should be exercised in the survey of the case to determine whether better results can be had by making the case in one piece or using the sectional method. Several factors of vital importance will determine to a large extent which method should be used, among which would be the size of the case and whether simple or complex; kinds of attachments to be used, but principally the ability and knowledge of the one constructing the case. Dr. Roach has always maintained that any case could be cast in one piece, but has suggested that better results would be obtained by using the sectional method, because of (1) simplifications of impression taking; (2) assurance of getting the parts of the impression in correct relationship; (3) positive reproduction of the parts to be supplied; (4) the ease with which the case can be waxed up and cast; (5) overcoming to a large extent the shrinkage, and (6) greater ease of adjusting the case in position, with greater satisfaction to the patient. This sectional method was taught because it was expected that these cases were to be built by dentists and that would insure greater satisfaction to the patients by following out the sectional construction. If the dental laboratories were to receive a mass impression from which the entire case is to be constructed, there would be an incentive from those interested in laboratory work to follow out the one piece casting because of the commercial factor, regardless of the satisfaction to the patient. There are indications for one piece castings and, in a vast majority of cases constructed to supply missing teeth in either removable bridges or partial dentures, this method will be followed out. The coinage of the term (one piece casting) was first used and the casting constructed by Dr. Roach in 1918, when he built unilateral double abutment bridges, casting saddles clasp and posts directly to the model. It has been my experience that, when these unilateral cases are indicated and the more simple case of bilateral types, sectional impressions, sectional construction and sectional adjustment will, in the hands of the average man, give better results because of the accuracy of parts to each other. In the past, we have been using two general types of

clasps, namely, the buccal lingual and mesial distal grip, with several variations of each one and also the embrasor grip. In either of these, especially the former two, it was necessary to have the abutments practically parallel. This is done by either grinding the teeth to some extent or relieving the impression around the gingival margin, each of which is determined by the position of one abutment to the other and also the tooth form and its contact with the opposing tooth. It can readily be seen that an accurate impression can be obtained in mass provided there are no undercuts, and this condition would be a determining factor in building a complex bilateral case. However, the great majority of cases that present themselves have undercuts, and the certainty with which an accurate impression in mass can be obtained is questionable. This being true, we cannot hope to have an accurate, well fitting appliance made from an imperfect impression. So the determining factors as to whether we make a one piece casting or use the sectional method are; (1) whether unilateral or bilateral, simple or complex; (2) the relation of the remaining teeth to each other; (3) the material used for taking the impression, and (4), the principal reason, the ability of the operator and whether he is going to follow the construction from beginning to end. In the strictly removable bridge, a one piece casting is used, but the impression may be obtained in sections or in mass, depending on conditions. In the partial dentures of gold construction, such as simple lingual bars, palatal bars and arch types, in which correct impression can be obtained in mass, these can be made by using the one piece method. The complex bilateral multiple space case will be simplified and give greater satisfaction to both operator and patient if constructed under the sectional method. Up to the present time, in our design of clasps, position of teeth has in a large measure determined which method to be used. But this new design of clasp will materially benefit the one piece casting. The new method of investing and burning out and casting shown will overcome shrinkage, which has been a detrimental factor in the large one piece castings. The success or failure of these cases depends on a correct survey, the construction of an appliance that is indicated and a thorough knowledge of how to build a case that will be serviceable and satisfactory to the patient.

Rupert E. Hall, Chicago, Ill.: Dr. Roach has spoken upon a subject this evening that has caused prosthetists much anxiety and hard work. He states that the casting of full dentures has not met with the same degree of success as the casting of smaller restorations. The difficulties encountered in making full base castings have thus far been unsurmountable. We have been unable to secure satisfactory adaptation, rigidity and lightness in the one combination required. A few years ago, I gave my undivided time and interest for an entire winter to the problem of casting full base dentures. The idea was conceived that a casting with the desired adaptation, rigidity and lightness could be made from a mold not modified by burning until the material forming it was weakened and caused to change shape, if there was some means of applying sufficient pressure to secure a casting in such a mold. It was further thought that shrinkage and warpage of the metal could be controlled or modified within practical limits, if the material forming the mold was hard like artificial stone. Molds were thus constructed and treated, and a pneumatic pressure casting machine was built, which developed the pressure required to drive the gold into such a mold. Everything worked out as designed and anticipated except the adaptation of the casting. The hard, unmodified mold failed to control shrinkage and warpage of the casting. Swaging the casting only partially corrects the inaccuracies caused by shrinkage and warpage. These unsatisfactory results have led many of us to use a combination design, making the palatal and ridge portion of the denture in metal and the periphery in vulcanite. The inaccuracies of the casting are minimized as its size is reduced and retention is made certain by the rubber peripheral seal. Dr. Roach has told you about a casting process that is different from any yet employed. It was my good fortune to see this process and equipment in advance of its showing and to be extended the privilege of trying it out practically. I have made every effort to apply it in my practice, but time and circumstances have not permitted. What I have seen of the work is very encouraging and I am not only eager to try it but also extremely hopeful that it will prove to be as good as it promises.

IDEAL PREPARATION OF THE ALVEOLAR PROCESS BEFORE DENTURE CONSTRUCTION

By J. W. CRAWFORD, D.D.S., Milwaukee, Wisconsin

(Read before the American Society of Oral Surgeons and Exodontists, Louisville, Ky., September 18-19, 1925)

IN order to render better denture service to the greatest number of denture patients, a few simple rules in alveolotomy are necessary, for the general practitioner to follow, since it is through his hands that the greatest percentage of dentures pass.

I believe that it is the duty of every practitioner and exodontist to so prepare the mouth at the time of extraction, whether the patient can afford to pay for it or not, that the best possible physical, mechanical and esthetic results will be obtained when the dentures are constructed.

After many years of general practice and several years of specializing in denture construction, I find that no one step in the work is more important than any other and that each step depends on the preceding step. As mouth preparation is the foundation of the work, it is necessary that this step receive special attention, and we also find that correct surgical attention overcomes many defects in our denture technic.

The method followed in our office is as follows: 1. Photographs, front view and profile, smiling and composed, one each, are taken. (Figs. 1 and 2, left.)

2. The following dimensions are recorded from the tip of the nose to the base of the chin; base of the nose to the incisal edge of the upper centrals; incisal edge of the lower central incisors to the tip of the chin. (Fig. 2, left.)

3. The position of the condyles, extreme posterior, medium and normal, is recorded. This is taken by placing the little fingers in the external auditory canals, as indicated in Figure 3.

4. Two impressions of the upper and two impressions of the lower are taken in wax or compound.

5. The shade and mold of the natural teeth are determined.

6. While this is being done, one upper and one lower impression is poured in quick-setting plaster. The highest position of the lip in the median line is noted and marked on the upper cast. If the lower gum shows above the lower lip line, that line is marked on the lower cast. We now take a face bow and get the relation of the occlusal surfaces of the teeth to the condyle.

Then all of the teeth are trimmed off at the gingival edge. The highest points in the labial and buccal pockets are noted and buccal and

labial surfaces of the ridge trimmed to a vertical line at right angles to a line drawn from the base of the nose to

Fig. 1.—Front view before and after restoration, for records.

the external auditory meatus. The palatal edge of the ridge is trimmed off about 1 or 1.5 mm. below the gingival edge. The buccal and labial edge is

Fig. 2.—Side view before and after restoration, for records; showing change in dimensions of lower third of the face after dentures were inserted.

trimmed off 2 or 3 mm. above the lip line, and the labial and buccal line and the palatal edge arced. The lower cast is trimmed in the same manner.

Fig. 3.—Method of testing condyle encroachment as result of posterior drift of the mandible.

We have tried the V and the U type of preparation and find that the prep-

Fig. 4.—Case in which alveolotomy is necessary.

aration that more closely conforms to a shape between the two, V and U,

shapes, as indicated in Figures 5 and 6, with the buccal or labial surfaces forming one arm of the figure and the palatal or lingual the other, gives us a better ridge on which to receive the stress of mastication.

Fig. 5.—Mark on labial surface of case showing high lip line. The lateral line shows the extent of process removed.

The fact that the labial and buccal surfaces of the ridge slope inward from above puts the valve seal near the periphery of the denture as well as near the crest of the ridge and the shunting of the denture from lack of proper occlusion or tissue resiliency is less apt to dislodge the dentures. The force of mastication, being on the line of the long axis of the teeth, brings the force on the edentulous surface on the widest area of the ridge, and it is the edentulous surface with the greatest surface at right angles to the lines of force that retains the dentures best.

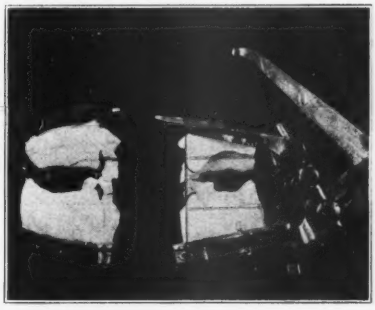

Fig. 6.—Direct lateral view. (Compare Figure 5.)

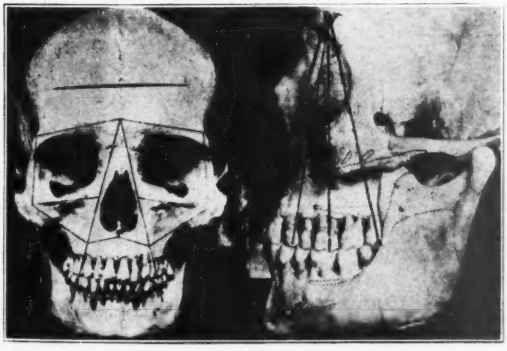

Fig. 7.—Normal lines of stress which must be observed when process is removed.

Figure 8 shows an extreme protrusion of the upper teeth and short dimensions. Note the relation of the palatal tissues to the incisal edge of the lower teeth. Opening the bite is indicated in this case.

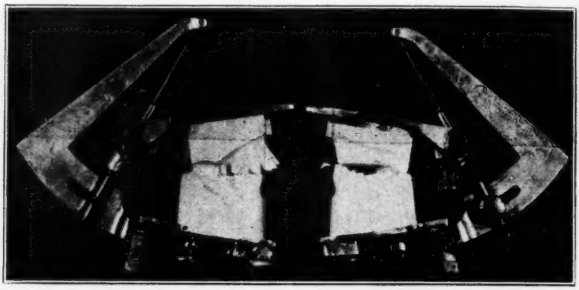

Fig. 8.—Cast showing extreme protrusion of maxillary teeth and shortening of facial dimensions.

Figure 9 is a duplicate of Figure 1 with casts on the instrument, before and after, superimposed, similar to pictures shown by Dr. Rhode of Milwaukee and Dr. Lischer of St. Louis. This case indicates a needed shortening of the bite or shortening of the facial dimensions.

Figure 10 shows the same casts on the instrument before and after extraction. Note the closer relation of the casts after mouth preparation.

Fig. 9.—Case shown in Figures 1 and 2, with casts before and after extraction, mounted on Monson instrument and superimposed on face, showing change in anatomic relation of the arches.

After the teeth are extracted, we place them in their respective positions in the second impressions, upper and lower, or both, as the case may be. The teeth are secured in place with wax, and the impressions, with the teeth in

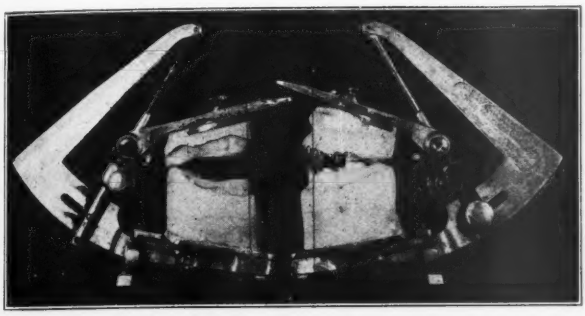

Fig. 10.—Case shown in Figures 1, 2 and 9, mounted on Monson instrument, showing the relation of arches before and after restoration.

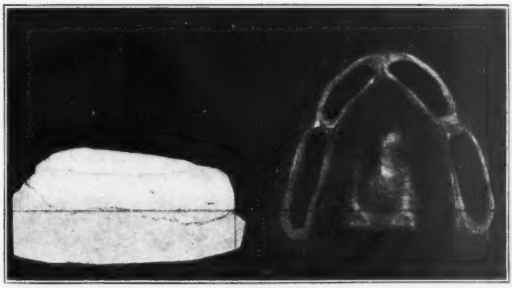

Fig. 11.—Upper cast and base plate with windows to permit seeing relation of base plate to tissue being trimmed.

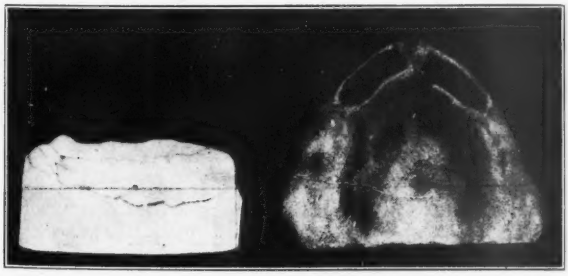

Fig. 12.—Upper cast and base plate with windows only over areas where teeth were extracfed.

place, are poured in plaster. When separated, the cast is trimmed up, and with the face bow relationship already established, the casts are mounted on the Monson instrument as shown in Figure 10.

After the upper cast is properly shaped, a base plate is made for it in the usual way. We use Graf's or Austin's because it is rigid and holds its shape under pressure. Holes are made in the base plate over the area where the teeth are to be extracted, so that the condition of the resected surface can be noted and trimmed to permit proper seating of the base plate.

These base plates and casts are sent to the surgeon or exodontist, and he uses it as a guide as to the amount of surgery necessary. The base plate idea was suggested by Dr. Sears of Salt Lake City, who used thin transparent celluloid pressed on the cast. We prefer the more rigid base plates, with windows, as we call them. (Figs. 14-15.)

Fig. 13.—Upper cast trimmed, with base plates.

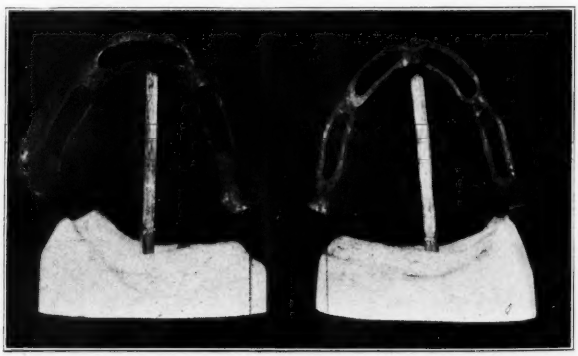

Fig. 14.—Two lower casts trimmed, with base plates ready for surgeon.

Figure 16 shows a lack of development of the maxilla and a slight protrusion of the mandible due to malocclusion

and the type of restorations that were made. In this case, the ridges were trimmed to the same rule. Figure

Fig. 15.—Case trimmed and base plate prepared for surgeon.

17 shows the same case. Over the area where teeth have been extracted for some time, and there is no need for

Fig. 16.—Case of lack of development of maxilla; left, before insertion of dentures; right, after insertion.

further preparation, we do not make an opening in the base plate.

Figure 18 shows another case in which the upper case was shortened and the lower lengthened for esthetic reasons.

Too little attention is paid to the abnormal position of the natural teeth

Fig. 17.—Case shown in Figure 16.

and the amount of gum tissue that shows during the normal action of the lips, and the recording of the same so as to prepare the tissues at the time of extraction in a way that will prevent

Fig. 18.—Case of overdevelopment of maxilla; left, before dentures were inserted; right, after insertion of dentures.

showing of the rubber gum and at the same time aid in establishing anatomic harmony. Unless the ridges are properly prepared, and these abnormal con-

ditions prevail in over 50 per cent of our cases, proper esthetics cannot be attained with dentures.

DISCUSSION

Alexander H. Paterson, Baltimore, Md.: I fully agree with Dr. Crawford that better denture service in the hands of the general practitioner demands some system or set of rules as a guide. My observations, covering a period of years spent in practicing prosthetic dentistry, are that no special attention is given ordinarily to the preparation of the mouth by the general practitioner. The usual procedure is the extraction of the teeth, and a wait for some time is then permitted before dentures are constructed. The technic presented by Dr. Crawford, with the simple order of procedure recommended, may be applied in general practice and be of great benefit to the operator, making for the success of his case as well as obtaining for the patient the greatest degree of comfort and efficiency. It has been my observation also that considerable differences exist in the technics of mouth reduction presented, and this difference of opinion among the writers has resulted in more or less confusion to the general practitioner. Some advocate extreme and some a more conservative method of process reduction. Many mouths have been ruined by too much cutting, and the technic offered by Dr. Crawford will not only aid in the construction of dentures, and in the comfort and efficiency of the patient, but will direct attention to the fact that mouths must not be reduced indiscriminately. I heartily endorse the idea of obtaining during the process of reduction all of the flat surface possible, and having the flat surface obtained directed at right angles to the direction of stress would accomplish the ideal in process reduction as far as denture stabilization is concerned. Permit me to quote the following[1] in regard to the part flat surface plays in stabilizing dentures:

"Stability will be in proportion to the location and amount of flat surface available. In any type of structural development, the first consideration is the foundation. A building of any consequence would never be erected on a foundation other than a flat surface. In fact, the more extensive the building, the greater the necessity of flat surface. No builder would consider for a moment a foundation of any other design. The whole superstructure depends, for its stability, entirely upon the character of the base. This law applies to denture construction as well, but, unfortunately in most cases, the foundation has to be accepted as it is and construction done accordingly. The necessary amount of flat surface to obtain the greatest degree of stability to seat the denture cannot be established mechanically in most cases, but has to be accepted as Nature designed it. A full appreciation of the mouth and its contents, and a careful, detailed examination of the surfaces over which the dentures are to rest is necessary in order to locate available flat surface and be able to interpret its value, although, at the present time, with the aid of the expert technic of the modern exodontist, more flat surface is available than in the past. The area and location of these flat surfaces are of the greatest importance, because it is upon them that dependence is placed. The wider the area of the flat surface, and the more equal its distribution, the greater the stability. The ideal would be a normal mouth with full square ridges, presenting an almost continuous flat surface. The opposite to this would be a mouth having thin pointed ridges, rounded in all directions with complete absence of flat surface. The extreme would be the abnormal mouth, greatly absorbed, rounded in all directions, and presenting a groove instead of a ridge. In the ideal example, stress being directed at right angles to the flat surface, the greatest degree of stability would be obtained, and there would be no tendency to tip or dislodge the denture due to the character of its base. Harmony of construction, although always considered to be an important factor, would not be so great a factor as in the other two examples presented. A fair degree of retention may be maintained in a case of this character, even with dentures of poor construction.

"In the example opposite to the ideal, stress not being directed at right angles to the flat surface except at the crest of the ridge and

1. Crawford, J. W.: Dent. Cosmos, January, 1923.

peripheral border, a lesser degree of stability would be obtained than in the ideal; a fair degree of retention would be maintained, however, for a time. Sooner or later, instability would occur, due to the character of the base, and harmony of construction would become a greater factor in retaining the dentures than in the ideal. In the extreme example, stress not being directed at right angles to the flat surface at any point, the least degree of stability would be obtained. The complete absence of a ridge, which is of some assistance in the second example, would permit the denture to roll and toss at will. Harmony of construction then would become the greatest factor in arriving at a successful result, along with the automatic arrangement of the surrounding tissues and dogged persistence of the patient. Retention or stability, therefore, will be in proportion to the amount and distribution of available flat surface. This explains the mystifying movement of dentures of excellent construction, but with more or less disturbance on one side or the other. It will be found upon examination in these cases that the jaw will present the necessary amount of flat base surface to stabilize the denture on one side, and on the opposite side lack it. On the side the lack occurs instability will be recognized, because the stress exerted, not being perpendicular to the horizontal, will tend to tip or dislodge the denture. This also explains the reason why success in developing retention in the upper jaw is more uniform than in the lower.

"The upper portion of the mouth always presents a wider area of flat surface, and as a rule it is a simple matter to obtain stability if the additional factors in denture retention are conscientiously applied."

I have every reason to believe that the general practitioner could master the technic outlined in Dr. Crawford's paper and apply it successfully in extractions in normal cases. In abnormal cases, the situation is entirely different; that is, when reduction is necessary for mechanical and esthetic reasons. The average practitioner lacks the skill and judgment demanded because of the limited number of cases and failure to appreciate fully the prosthetic requirements. The abnormal case should be treated by the specialist; the exodontist should be fortified with the knowledge of the prosthodontist, and there should be a close cooperation between the two to obtain in the finished case the best possible result.

Menifee R. Howard, Denver, Colo.: The paper given by Dr. Crawford is an important one for the regular dentist as well as for those of our chosen specialty. We do not lay importance enough on the preparation of mouths for dentures. I have just come from a city where I have been in touch with most of the surgeons and exodontists, and it is my observation that they are paying little attention to trimming of the process, and that many adhere to the methods of thirty years ago and are not taking advantage of the opportunity for ideal preparation of mouths for dentures and for removing infection. It has been my privilege to work with two or three men that are doing that work and they have checked up on those cases prepared by trimming of process and also on similar cases in which there has been no preparation, simply extraction of the teeth. In two instances, covering a period of about six years, these men have observed that when the processes have been trimmed and as nearly ideal a preparation as possible is presented, there is little or no resorption of the ring afterwards. In other cases, in which the processes have not been trimmed, there is extreme resorption of the process, even to the extent of entire obliteration, so that the advantages in the trimming of the process, I believe, are very important. Practically all cases should be trimmed. The little area under the gum that is discolored should be removed, and thus the ring is fixed and will remain there.

F. F. Molt, Chicago: The principles here outlined are established to such a degree that they can't be controverted. It is all a matter of achieving this result in the best possible manner. That is where the difference of opinion apparently comes in among the members of our group.

Dr. Crawford (closing): In Dr. Patterson's discussion, attention is called to lack of retention in the lower as compared to the upper. We have found that the lack of horizontal surface of that lower ridge and the

lack of proper lines of force in setting the teeth so that the force of mastication is directed to the base or the greatest horizontal area is the cause of the unseating of the lower denture. In the average case, if one-third of the process is trimmed off from the gingival line to the root end, the lower two-thirds of the alveolar process presents to the force of mastication the greatest amount of horizontal surface. We get more retention from a ridge like that than from one that is high. In the past, we have always feared to resect too much of that process, because we hear today, "If I had not had so much of that bone trimmed away, I would not have had so much resorption." Resorption is due to two causes, misdirected force and systemic conditions. Misdirected force is the greatest factor, I believe, in resorption of the ridges, and we find that when the force is properly directed and the ridge is so trimmed that the stress of mastication is applied at right angles to the seating base, we get less change in the tissue. When we fail so to arrange the arch in our denture, we have trauma. We have thought that the cause of loose dentures was a poor impression. We have all made dentures that had good adaptation to the seating area, but when the patient closed in occlusion or smiled, the denture was unseated, owing to arch arrangement and improper mouth preparation. Unless we take the development of the arches and masticating mechanism as a whole and make a diagnosis to establish anatomic relation and facial dimensions, we cannot hope to produce the proper lines of force so as to retain the denture in the best position possible on the ridge. If a line is taken as high as the lip line in the labial area; the highest point in the buccal and labial pockets is marked and resecting begun midway between those two lines, and a nice round arched ridge is obtained on both the upper and the lower ridges, the prosthetists will have better results and the patient better satisfaction.

The Journal of the American Dental Association

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Editorial

"STOMATOLOGY OR DENTISTRY?"

Under the title "Stomatology or Dentistry?" that splendid publication the *Boston Medical and Surgical Journal* publishes an editorial in its December, 1925, number which merits consideration. It was brought out by the suggestion of a certain group in the dental profession which has some very illogical and visionary ideas pertaining to the future of dentistry. Among other changes, this group advocates the following: "To establish stomatology as a specialty of medicine, to be practiced by graduates in medicine and stomatology." This idea is so far from being new that, in the minds of the most constructive thinkers in dentistry, it has been buried for years. Why try to revive it now? It cannot be done. Another suggestion is as follows: "Until the law requires the M.D. degree for the practice of dentistry, and during this transitory period, arrangements will be made as soon as possible, for licensed practicing dentists holding the D.D.S. or D.M.D. degrees from reputable institutions to be granted the M.D. degree, after suitable preparation and qualification."

The comment of the *Boston Medical and Surgical Journal* is so sane and sensible that if space permitted we would reproduce all of it. A few quotations will suffice to show the tenor of the editorial.

> We are rather appalled, however, by the thought of imposing upon thousands of good dentists the necessity for undergoing further studies in order to gain a degree of M.D. which will not permit them to practice medicine. Many a prospective dental student, it would seem, would hesitate before investing the additional time and money required to give him a medical degree and one year in a hospital, plus his technical training in odontology. We believe, though admittedly without definite knowledge of the subject, that at least nine-tenths of the work required of dentists is of such nature that it can be performed with perfect satisfaction with the education already provided in good dental colleges. In such schools the fundamental sciences—anatomy, physiology, bacteriology and pathology—are taken up in detail, and the relation of odontology to the organism as a whole is certainly made clear. It may be mentioned in passing that the Section of Stomatology of the American Medical Association has been given up because of poor attendance at the Annual Session.
>
> We fear that the result of the changes in the status of the dentist as desired by the American Stomatological Association would in truth be deleterious to the public health. Fewer men would enter dentistry, because of the increase in cost and because of the attraction to those other fields of medicine which would be open to them. The cost of dental services, already burdensome, even though warranted, would be increased, thereby driving more patients to the free clinics, or leading them to neglect their teeth.
>
> We suspect that the feeling of social inferiority which is believed by some to attach to the profession of dentistry as compared with that of medicine has considerable to do with the desire to place the dentist on a plane with the specialist who has an M.D. degree. Whether or not such a distinction really exists we cannot say. There are socially charming dentists and socially impossible doctors. It seems probable that, in the long run, everyone secures that standing, social as well as professional, to which his parts entitle him. We wish no injustice to the doctor of dental surgery, who has indeed our heartiest respect and often our profoundest gratitude. Would he be more able to help either humanity or himself if the letters after his name were changed?

We think not. This constant straining after things unattainable, and this pathetic apeing of those of supposed superior position in life is humiliating to the members of our profession who have any self respect. The observation of the medical editor just quoted is so broad and liberal, and the issue is so clearly stated, that it may well be employed as an argument to lay the periodical ghost which rises at intervals on this question. Of

course, dentistry is a specialty—it is a specialty of the great healing art, and not a specialty of medicine as constituted and practiced today. And it never can be for the very reasons advanced by the editor of the *Boston Medical and Surgical Journal.*

The criterion on which all such questions are finally decided is the one of extended practical test, and the point may logically be raised as to which system has proved of the greatest value to the people—the one in vogue in America whereby dental education is under the direction of dentists, or the one in certain other countries where medical men dominate the entrance to dentistry.

It is always ungracious to make invidious comparisons in matters of this kind, but the verdict of the world at large has been emphatically in favor of the American system. It is the people we serve who have to be considered in these matters, and not the supposed prestige of the professional man, and when it can be shown that better service will come to the people under the proposed plan than has been given them by the system in operation for more than eighty years, it will be in order to suggest a change—but not till then.

"DEAD TEETH"

This unfortunate term has been accountable for the loss of many useful teeth, and it should be expunged from our literature. It is the fault of the dental profession that it was ever employed, and it should be the duty of the profession to see that it is eliminated. Medical men, not familiar with dental structures, naturally accepted the term at its face value, and it was accordingly logical for them to order such teeth extracted. No physician with any judgment would want anything "dead" left in his patient's mouth, and if a pulpless tooth were really a dead tooth, there would be no tenable argument in favor of its retention. But a tooth with a good pericemental membrane surrounding the root and attaching it to the alveolar process is by no means a dead tooth.

When the pulp dies, sensation is eliminated from the dentin, which can then be drilled or cut without pain, and this circumstance led to the impression that the tooth was dead. It was a very natural misconception on the part of dentists, and no blame should be attached to them for its introduction. But the blame lies in the fact that this term was permitted to continue even after its fallacy was shown, and when the damage done through its use had been amply demonstrated. Today, physicians quite commonly speak of "dead teeth" when they mean pulpless teeth, and the distinction between the two should be shown them by every available means.

Even without the histologic evidence, which is incontrovertible, the fact that these teeth frequently remain in the mouth for many years without being exfoliated is conclusive proof that they are not dead. A tissue that is dead will not be tolerated for any time by the system.

The harm that has been done by the use of this term can never be estimated. Patients, when told that they have dead teeth, are quite likely to begin to feel uncomfortable at once, and the fact that at least some of our ailments have a psychologic basis lends itself conveniently to the general mental demoralization which assails certain people under such circumstances. The term pulpless teeth is not only more accurate histologically, but also much less terrifying to the patient. The message should be carried to the medical profession through every possible medium that, when they speak of dead teeth, they are using a misnomer which is not only unjustifiable but also calculated to work a grave injury to their patients. Medical men are usually genuinely anxious to serve their patients in the most efficient way, and if they have been led astray by dentists in the use of this unfortunate term, it is high time that dentists do their share in correcting the error, and showing their medical brothers its fallacy. When this term is finally eliminated from medical and dental nomenclature, we shall have a more intelligent mental attitude toward the extraction or the retention of such teeth.

JOHN HANGER KENNERLY, D.D.S., St. Louis, Mo.
(1856-1926)

JOHN HANGER KENNERLY, D.D.S.

John Hanger Kennerly, dean emeritus of the Washington University School of Dentistry, died Jan. 29, 1926, at St. Petersburg, Fla., at the age of 69. Death was due to pneumonia.

He was born May 2, 1856, at Hermitage, Va., the son of Dr. Samuel Kennerly (a physician), and Frances Hanger Kennerly. He attended the country schools and, later, New Hope Academy.

He began the study of dentistry with Dr. J. H. Yost at Shelbina, Mo., and took the course of lectures at the Missouri Dental College (now Washington University School of Dentistry), from which he received the degree of D.D.S. in 1888.

He was secretary and professor of prosthetic dentistry in the Marion-Sims Dental College from 1894 to 1899, when he resigned and was made professor of mechanical dentistry and secretary of the faculty of the Dental Department of Washington University. In 1901, Dr. Kennerly was elected dean and professor of clinical dentistry, which positions he occupied until his retirement, in 1922.

Dr. Kennerly joined the Missouri State Dental Association in 1889, served on various committees and frequently as a clinician, and was corresponding secretary (1902), first vice-president (1903) and president (1905). He was president of the St. Louis Dental Society in 1897, secretary of the National Association of Dental Faculties, 1897 to 1905, and president of the same association in 1906. He was president of the Institute of Dental Pedagogics in 1898, a member of the American Dental Association, and of the Central District Dental Society of Missouri, and a corresponding member of the Illinois State Dental Society. Dr. Kennerly also served as president of the Dental Faculties Association of American Universities.

Dr. Kennerly married Miss Alice V. Stark, of Dover, Mo., who survives him.

NEWTON A. TEAGUE, D.D.S.

By H. H. JOHNSON, D.D.S., Macon, Georgia

Newton A. Teague died at his home in Augusta, Ga., Dec. 21, 1926, of apoplexy, in the sixty-fourth year of his age. Burial was in Westover Cemetery, Augusta.

Dr. Teague was born in Charleston, S. C., Oct. 4, 1861. His parents were Isaac Newton and Elizabeth Catherine Nelson Teague. His preliminary education was obtained at Edgefield and Aiken, S. C. Later, he was sent to Porter Military College at Charleston, which he attended during the years 1875-1877.

NEWTON A. TEAGUE, D.D.S., Atlanta, Ga.
(1861-1926)

Having decided to study dentistry, he entered the office of his elder brother, the late Dr. B. H. Teague, at Aiken, where he took a preliminary course, 1878-1879. In the fall of 1880, he matriculated in the old Baltimore College of Dental Surgery, taking the first course of lectures there. He later matriculated in the University of Maryland, Dental Department, from which he graduated in March, 1883. After graduation, he entered practice with his brother, removing to Augusta, Ga., in 1884, where he resided until the time of his death.

Dec. 4, 1889, he married Elizabeth Nesbett Dawson. The following children survive: Newton Nesbett Teague, of Augusta, Penrose Truett Teague, of Atlanta, Addison Dawson Teague, Miami, Fla., Miss Eleanor Eloise Teague, of Augusta, and Mrs. John C. Groome, Jr., of Philadelphia.

Dr. Teague was a member of the Tenth District Dental Society, the Georgia State Dental Society, the American Dental Association and the Psi Omega Dental Fraternity. In 1922, he was elected president of the state dental society. He was an ex-president of the old Augusta Local Dental Society. He was a number of times called on to represent the state society in the national sessions. His contributions to dental literature were many and valuable.

Dr. Teague had served as captain of Company B, Oglethorpe Infantry, Augusta, and as major in the 6th Regiment of Infantry of State Troops, and also of the 3rd Regiment of the National Guard. He took an active part in religious and civic affairs.

In the death of Dr. Teague, a great loss has been sustained by all who knew him, the state, the church, the profession and the community. We are poorer when such as he passes because there are few to take their places.

DEPARTMENT OF DENTAL HEALTH EDUCATION

PLANS FOR AND RESULTS OF A STATEWIDE DENTAL HEALTH WEEK*

By C. J. HOLLISTER, D.D.S., Harrisburg, Pennsylvania

(Read before the American Dental Association, Louisville, Ky., Sept. 22, 1925)

AFTER noting reports of successfully conducted dental health weeks in Minneapolis and Detroit, the Mouth Hygiene Committee of the Pennsylvania State Dental Society decided to inaugurate a state-wide health week observance. At the annual meeting of the state society, in Pittsburgh, May, 1924, the council of the society was asked to grant permission to the Mouth Hygiene Committee to conduct a Dental Health Week. This request was granted, and at that time the committee began to plan what to do and how to do it.

The chairman of the committee visited practically every component society during the next fall and winter, urging their active cooperation. The state society quarterly and the *Bulletin of the Odontological Society* carried in each issue a full page, bearing a plea to the profession to do their bit, and printed a blank to be filled in and mailed to the committee headquarters.

The profession responded splendidly with a membership of about 2,500. Eight hundred sent in the blank and had supplies sent to them. The state department of health cooperated fully, bearing much of the expense of the committee, supplying mimeographed material, postage, etc. The state department of education gave their approval for the celebration of dental health week in the schools of the state.

The date set was the week of February 22, 1925. Our state is divided into nine zones by the mouth hygiene committee, each zone having a general chairman or chief, and he, in turn, appointing local captains in counties and cities. This scheme of organization was affected two years ago, and was well enough organized to give a foundation upon which to build. (This plan of organization may be had by addressing the Dental Division, State Health Department, Harrisburg, Pa.)

One week before Dental Health Week, the following notice was released through the health department

*The papers of Dr. Hollister and Miss Schmidt, with those of Drs. White and Buckley, published in the February issue, made up a symposium on dental health education for the laity, read before the Section on Mouth Hygiene and Preventive Dentistry.

to the Associated Press and all other news agencies in the state, and was printed by practically every paper.

Dental Health Week, under the auspices of the Pennsylvania State Dental Society and with the cooperative efforts of the State Department of Health and Education, will be observed in every community in Pennsylvania during the week, beginning February 22.

School medical inspection shows that 70 per cent of all school children have tooth defects, and the reason is, usually, faulty diet, lack of home hygiene or neglect of the teeth due to ignorance of the need for it.

The dental profession of Pennsylvania will conduct an education campaign, from which great good is expected.

This is the first state to conduct a public dental health week, and the result will be eagerly watched by the dental societies of other states.

The literature sent out by the committee consisted of general suggestions to local dentists, which I will read.

SUGGESTIONS FOR CONDUCTING DENTAL HEALTH WEEK

Arrange (where possible) with ministers of all faiths to preach sermon on dental and general health or, at least, to announce the activities of DENTAL HEALTH WEEK.

Enlist cooperation of local school authorities (public, parochial, and private).

SCHOOL PROGRAM:

1. Arrange talks about care of teeth to all school children by dentists, nurses or dental hygienists.

2. Conduct essay contests on "Care of the Teeth" among school children, prizes to be given by parent-teacher associations, Rotary, Kiwanis, Lions, Quota and civic clubs or any other local organizations; judges to be superintendent or principal of schools, dentist and a member of club or organization awarding prize. Essay contest can be conducted in rural schools.

3. Care of teeth and general health posters to be made as part of drawing lesson in all schools.

COMMUNITY PROGRAM:

1. Arrange for dental program for all community organizations such as Rotary, Kiwanis, Lions, Quota and civic clubs.

2. Where possible, to have a community mass meeting having dental hygienist, nurse or teachers, train children in health playlets, toothbrush drills, etc.

3. Have dentist give talk on care of baby teeth and description and value of first permanent molar to mothers at all baby clinics.

4. Where it is possible to finance locally, have stickers made to be placed on automobile windshields carrying the following slogan (size 5 by 8)

DENTAL HEALTH WEEK
WATCH YOUR TEETH
FEBRUARY 22 to 28, 1925

Larger cards with the same slogan should be placed in show windows of local stores. Where there are trolleys, have this slogan at front and rear of and inside cars, if possible.

5. Have drug stores and all other places selling toilet articles make a window display of toothbrushes and dentifrices.

6. Have motion picture houses and theatres make and show five slides. Suggested thoughts for slides are:

1. Dental Health Week
   Watch Your Teeth
   Feb. 22 to 28, 1925.
2. Good Teeth
   for
   Good Health.
3. False Teeth Are Like
   Crutches to Help a
   Lame Man Walk.
   Keep Your Own.
4. A Stitch in Time
   Saves Nine Applies
   To Teeth as Well as to
   Torn Garments.
5. Visit Your Dentist
   Twice a Year and Your
   Dental Troubles Will
   Be Little Ones.

7. Where a dental hygienist is available, arrange to have her demonstrate in the window of a local department store, using portable equipment and working on school children. Put on two demonstrations a day, 11:30 a.m. to 1:30 p.m., and 2:30 to 4:30 p.m. The foregoing has proved very effective.

8. Obtain all newspaper publicity possible, carrying notices of events of the week and prepared articles on "Teeth and Health."

NOTE: The suggestions given above are to be used in part or as a whole, added to or improved on according to personal opinion and local conditions. The object of this campaign is to give the public proper information on importance of care of the mouth. The application of any plan or activity that will accomplish the foregoing should be used whether mentioned in these suggestions or not.

Do not fail to report *any* activities in your community during this week to Dr. C. J. Hollister, Department of Health, Harrisburg, Pa., so that the mouth hygiene committee may have a complete report to make at the state meeting.

In addition, three outlines of lectures were prepared by a special committee of the state society, one for children, one for service clubs and one for parent-teacher associations.

Time or space does not permit of many details of our dental health week. The observance was much more successful than the committee had dared to hope: first, because of the prevailing feeling that the public had had too many special "weeks" and secondly, that its success depended almost entirely on local effort.

The following editorial from the *Blair County Medical Society Bulletin* is a fair sample of many editorial expressions favorable to another "Week."

We thought that every week in the year's calendar had been set aside for some drive or other, but it appears we were mistaken. One week at least was not snapped up and so the state health department of Pennsylvania was enabled to use it for dental health. Here was a really worthwhile use of the whole page of the calendar. Of late, there have been so many drives for this and that, with a raisin week and an orange week and a what-not week. The public is almost leery of drives and "weeks," but dental health strikes so close to the root of our health and happiness that the recent drive merited the approval of everybody.

America is far ahead of other countries in the matter of teeth, but as yet only a beginning has been made. The statement has been made that, in the U. S. A., only about 2 per cent of the people visit a dentist regularly. One-half hour spent with a medical inspector in our public schools will convince the most skeptical that the condition of the average school child's teeth is little less than terrible. True, in Altoona the missionary work has been started and is making good progress, but the work in the schools will have to be multiplied tenfold before the situation can be said to be in control. The public conscience must be awakened so that our school authorities will feel warranted in spending enough money to do more school hygiene.

Dental Health Week and kindred propaganda aim to show the public how important good teeth are and how to get and keep them.

The stimulating reaction to the promotors of dental health week was the whole-hearted response by the dental profession to the call for community service, showing that our profession is awakening to the fact that it has an obligation beyond the restricted number of people making up the individual practice, and that the true service the dentist owes to humanity is prevention by education. A leading railroad official stated in a railroad magazine not long ago that the frightful toll of human lives lost in crossing casualities could only be eliminated by educating the public. This is a truism that applies to matters of health as well.

The results of our dental health week will be seen more in the years to come than in the immediate present. However, with the opening of schools this fall, at least a dozen counties have preventive dental education that would not have it but for publicity given through dental health week. The mail of the dental division of the department of health daily contains letters from dentists asking how they can best serve the public of their community.

The council of the state dental society has granted permission to the

mouth hygiene committee to conduct another dental health week in 1926.

Texas had such a week and Mississippi, I believe, will have one this fall. It is our hope that this idea will grow until we will have a national dental health week put on by the American Dental Association, for our experience in this work prompts us to say that, by this method, the dental profession can reach the greatest number in the shortest time. The press and people of the country seem to be eager for information on preventive dentistry. The interest shown by school authorities indicates that, through this medium, we will eventually have fifty-two dental health weeks annually instead of one.

SUGGESTIONS CONCERNING COOPERATION BETWEEN MOUTH HYGIENE COMMITTEES AND OFFICIAL AND UNOFFICIAL HEALTH AGENCIES

By EVELYN C. SCHMIDT, Chicago, Illinois

(Read before the American Dental Association, Louisville, Ky., Sept. 22, 1925)

IN order to help solve our national dental health problem, every state dental society should have a working committee on mouth hygiene and public instruction; and in order that this may function most effectively, its members should have a clear and comprehensive understanding of public health agencies and public health problems, since mouth hygiene is a public health problem. Every dentist is a potential member of his state mouth hygiene committee. Therefore, it is hoped that a discussion of the cooperation necessary between mouth hygiene committees and official and unofficial health agencies and their problems will not be irrelevant at a section meeting such as this. Let us briefly discuss:

1. Health agencies and health problems, international, national and statewide.

2. Methods of organization of dental societies for an educational program which have proved effective in various states.

3. Types and cost of programs that are being carried on.

4. The benefits that are derived from a statewide dental health program.

HEALTH AGENCIES AND HEALTH PROBLEMS

Viewing public health from an international point of view, we find that there are three health bureaus in the world organized to study worldwide health problems. These are the outgrowth of international congresses and conferences on various subjects pertaining to health and have representation from various countries in the world. The first of these conferences was held in 1852 at Brussels. It was in 1907 that the first international health bureau

was established in Paris—the Office International d'Hygiene Publique. This is the largest of the health bureaus, forty-one countries participating in the work of the Office. The other two agencies are the Pan-American Sanitary Bureau and the International Sanitary Conferences of American Republics, and the Health Organization of the League of Nations. Two recommendations have been made by the former group which should be of interest to the dental profession:

1. The proper authorities should establish in school programs the obligation of teaching the elements of hygiene and prophylaxis of communicable diseases, employing preferably visual illustrative methods.

2. The government is urged to prevent pharmacologic quackery and deceptive medical advertising.

The work of all three groups is arranged so that there is a definite goal for each, with no overlapping and duplication of effort. Such problems as the plague, cholera, yellow fever, tuberculosis, malta fever, typhoid fever, trachoma and leprosy are studied.

Next, let us consider public health from a national point of view. There are in this country official and unofficial health agencies. An official health agency has been defined as a governmental agency, federal, state, county or city, which is the legally constituted agency of health within a given territory. These agencies derive their authority directly from the legislative assembly of the citizens and to them, as a rule, is delegated the authority to make rules and regulations which have the force and effect of law. The function of official health agencies is seldom clearly defined by law as to the detail of administration, but they are usually authorized in general terms to take whatever step may be found necessary for the protection of the public health and the conservation of human life. Originally, official health agencies concerned themselves almost entirely with the diagnosis and control of disease. Sanitary engineering, including the control of water supply; and food and drug problems, for instance, demanded their attention, and still do. It is agreed now, however, that an official health program, national, state or community, should also include prenatal instruction; baby welfare and child health education; social and mental hygiene; periodic health examination; antituberculosis work; venereal disease control; posture and nutrition work, and dental service and dental health education. Most official health agencies in the states cannot carry on so broad a program because it has not as yet been demonstrated satisfactorily to the taxpayer that such a service is necessary, even though the medical profession agrees that this type of program is essential for community and state betterment. Therefore, all official health agencies are handicapped because of lack of funds. Our national official health agency is the United States Public Health Service, with headquarters at Washington, D. C.

Since official health groups, because of lack of funds, cannot carry on so thorough and complete a program as is essential, there is a justification for the existence of nonofficial health agencies. These may be divided into two groups, one of which is the privately supported, voluntary agency, self-committed to one or more health activities and responsible only to its contributors and to public sentiment. In this class, we find such groups as the American Public

Health Association, National Tuberculosis Association, American Child Health Association, American Society for the Control of Cancer and National Committee for Mental Hygiene. There is another type of agency that is official, such as the welfare agencies, the departments of education, the agricultural extension services and the child welfare departments, all of which understand that their functions include some of the fundamental phases of public work but that they carry on this work not as the official health agency.

The Department of Dental Health Education of the American Dental Association cannot be classed as an unofficial health agency at present for its status is not yet established; nor is its scope or standing yet solid enough to justify this title. The department is interested primarily in a specialized phase of the public health problem. Because of this, it is working in cooperation with not only official but also unofficial health agencies. We have made contacts with the United States Public Health Service, the Department of the Interior, the Children's Bureau, the United States Department of Education, the National Tuberculosis Association, the American Child Health Association, National Public Health Association, etc.

In state health organization, we find the same groups: the official health agency—the state department of public health; the official groups interested in public health, such as the state department of education and the agricultural extension service; and the unofficial groups, such as the state associations of the Tuberculosis Association and the American Red Cross. Subdividing the state, we find that the community has corresponding groups entrusted with and interested in the health of its citizens. No committee on mouth hygiene and public instruction of a state dental society should attempt to develop a program on dental health education within that state without consulting representatives of all of these health groups in order that there may be complete understanding, harmony of purpose and no duplication of effort. The same applies to community projects. It is only by having the fullest cooperation of all that a satisfactory dental health program can be carried on.

METHODS OF ORGANIZATION, TYPES AND COST OF PROGRAMS

Unquestionably, every state must develop its own type of organization, fitting the needs and the budget. In Pennsylvania, the chairman of the committee on mouth hygiene and public instruction of the state dental society is also the full-time dental director of the state department of public health. The state is divided into nine zones, each of which has a general chairman or chief appointed by the commissioner of health. The zone chiefs, in turn, appoint captains in the counties and cities in their locality and report their zone activities to the general chairman. One tangible result of the efficacy of this organization is shown by the fact that there are now more than 100 dental hygienists (whose work is almost entirely supported by community funds) engaged in public school work in Pennsylvania. Noteworthy legislation, a successful statewide dental health week, and a keener understanding of public health problems by the dental profession and of dental problems by public health officials have resulted also. The budget for such a program must, of necessity, be large, for it must include the salary

of a dentist, a dental hygienist and a stenographer, and also the cost of material and supplies. The outstanding fact is that the state dental society contributes financially to this work.

At a cost of only $200, but with untiring work on the part of a few earnest, sincere mouth hygiene enthusiasts, Texas was organized, and a statewide dental health week was held, to which all dentists responded heartily; proving that it is not always the actual budget but the mental attitude of the men in the profession in the state that determines the scope and force of a dental health program. As a result of the interest taken in Texas Dental Health Week, many communities are developing regular dental programs.

In Massachusetts, each district dental society appoints a representative or representatives, according to the number of members in the district society, to the dental hygiene council. Members of this council meet periodically with representatives of the state department of public health, which employs a full-time dental health worker. Policies are discussed, and material for state distribution is compiled and endorsed. At present, plans are being perfected for an itinerant dental educational service. The equipment is to consist of a portable chair, mouth examination equipment and material for classroom instruction. A dental hygienist will be in charge. She will go to the rural communities, where there is no local dentist, examine the mouths of children, give classroom instruction, and report her findings to the state department of health in order that a follow-up program may be developed. In larger communities, where the local health workers and dentists are anxious to establish a preventive dentistry program, she will go out at their request, for a limited time, in order to demonstrate the type of program that may be developed. In every instance, the community will remunerate the council for the services of the clinic.

In Kansas, the state dental society is concentrating on the impressionable age—that of the school child—and is working in closest cooperation with the state department of education. Motion pictures purchased by the mouth hygiene committee are sent gratuitously, except for postage, to any school or group interested in health problems. Accompanying these is a set of posters. Annually, the dental society offers prizes to the school making the best group of posters on dental health.

Illinois is conducting an intensive statewide campaign in conjunction with that of the Illinois Medical Society. Both are working closely with the state board of health, federation of women's clubs and the unofficial health groups. Since the Department of Lay Education of the Illinois Medical Society has a budget of about $30,000 with which to work this year, and employs a full-time field worker, it is an advantageous alliance for the Illinois Dental Society. Illinois has twenty-seven component societies, grouped into seven districts. A plan is being developed whereby each component society will elect a representative whose function will be to further mouth hygiene work; that is, to distribute material and assign speakers in his territory. From the twenty-seven men thus elected, seven, each representing a district, will be appointed to compose the executive committee of the state mouth hygiene committee. The program of this committee is being worked out on a 5-year basis, and is to cover the educational field only at pres-

ent, with employment of a full-time worker, connected with the state department of health, as the goal. Members of the state society are being canvassed to submit ideas for posters, slides, radio talks, lectures, etc. Classes in public speaking are being conducted in order to train men who can not only give dental facts, but also give them forcibly and convincingly to lay groups. The services of three radio broadcasting stations and 400 newspapers are at the disposal of the committee. In every issue of the *Illinois State Dental Society Bulletin*, and weekly in the *Bulletin of the Chicago Dental Society*, there is a page devoted to dental educational work.

Other states carry on various types of programs according to the budget that is allowed them, and many of these are very effective.

BENEFITS DERIVED FROM A STATE-WIDE DENTAL HEALTH PROGRAM

It is a sincere interest in dental health work on the part of every member of a state dental society rather than actual funds that counts for most in a state-wide dental health program; for, with sufficient sentiment behind the members every mouth hygiene committee, with practically no funds available, can interest the state commissioner of public health to appoint a dentist as consultant on his advisory board. This is merely a stepping stone toward the appointment of a full-time dental director under the auspices of the state department of health or of education, which should be the ultimate goal toward which every state dental society, through its mouth hygiene committee, is working; for the state department of health is the official agency in that state, entrusted with the health, including the dental health, of its citizens. Various states have dentists working in a consultant capacity. Most of the men serve gratuitously, having traveling expenses paid, while three receive an honorarium of about $100 yearly. There are now twelve states that have full-time dental workers. New York has a dentist with the department of education. The other states employ their workers under the state department of health. Iowa, Michigan, Pennsylvania, North Carolina, Oklahoma, South Carolina and Virginia have dentists; Maine, Massachusetts and Connecticut have dental hygienists, and Mississippi has a physical education teacher carrying on the dental work. Recently, the Province of Ontario employed a full-time dental director. The salaries of these workers vary from $1,500 to $6,000 a year. If every state dental society visualized as its goal five years hence the appointment of a full-time dental worker, to be employed by its official health agency, it would not need to have a large budget. On the other hand, since considerable publicity work must be done before sufficient sentiment can be created for such an appointment, at least $200.00 should be available for every state mouth hygiene committee annually. More important than the money is the men. A well-defined program within your state would increase the strength of the organization within itself, and would mean a gain in membership and an increase in the active, interested percentage of the membership. It would also mean that the dental profession was awake to its responsibility and taking its place with other specialized health groups.

DISCUSSION

Henry L. Banzhaf, Milwaukee, Wis.: The details given in Dr. Hollister's paper, concerning the dental health week which was planned and successfully executed by the Pennsylvania State Dental Society last February are most instructive because they give us an idea of what may be accomplished in every other state and the variety of activities that may be undertaken. The success of this effort undoubtedly was due to the fact that the Pennsylvania State Dental Society succeeded in interesting the state department of health, the state department of education, and the service clubs, such as Rotary, Kiwanis and Lions. With all of these agencies at work, the problem of securing free newspaper and show window publicity was made easier and the public interest was aroused. The altruistic motives of these forces which were enlisted by the state dental society are not questioned by the citizenship of Pennsylvania. Thus, in spite of the fact that the idea of designating certain weeks for certain activities has been done to death and is no longer looked on with favor by the public at large in most parts of the country, the efforts of the Pennsylvania Society were crowned with success. While a raisin week, orange week or an apple week no longer stirs the public imagination, a dental health week will always arouse interest, I believe, provided it is properly planned, as it was in Pennsylvania. The idea of inviting the assistance of the service clubs is a good one; in fact, the interest of these clubs should be enlisted for fifty-two weeks each year instead of one week. Dental health work is so extremely worthwhile and pays such large and immediate dividends that the intelligent membership of these clubs which comprise the leading citizens of each community will be eager to engage in it, once the problem is presented. The public interest will be stimulated by essay contests on assigned dental health topics for public school children, which may be conducted by these clubs at little or no cost. These clubs will also be glad to invite dentists to appear before them to give their message. They will be glad to lend their powerful influence to see to it that our primary schools have the educational services of a proper number of hygienists and dentists. Let us make use of our Rotary, Kiwanis and Lions, and other service clubs. We have neglected to make full use of them in the past. That is the principal message that Dr. Hollister, in my opinion, brings us in his paper.

B. Lucien Brun, Baltimore, Md.: The wonderful strides of dental education during the last ten years are certainly a promising augury for the future of community dental education and dental service, for inevitably the next step in dental educational endeavor will be made by the dental profession for the laity. That this is no longer a dream of the idealist has been proved by the papers we have just listened to. This phase of public education is today a reality, though still in its formative processes, having been practiced only here and there over the country with a well-organized and well-thought-out plan of campaign. Every individual, adult or child, has a right to all the advantages of a clean and healthy mouth and to useful and well kept teeth, and, as Dr. White reminds us, "If you win the child, by having it understand the importance of a clean and healthy mouth and teeth, you win the parent." The young mind is most receptive and will absorb your teachings quickly; therefore, the child is best suited to be taught these principles of clean mouths and sound teeth. The dental subjects presented in the schools will be repeated in the home. The booklets and the literature will be read by the parents, and if the child has been properly impressed, the parent will also receive the message and put into practice its principles. Then let our first appeal to the child be a pleasant one and a convincing one, for first impressions are usually lasting. So much of the development of the physical side of the men and women of tomorrow depends on the care, the training and the example given to the boys and the girls of today that I do not believe that we can stress too strongly the importance of including the proper care of the mouth and the teeth as two great adjuncts toward healthy bodies and strong minds. It is by such forms of campaign as Dr. Hollister outlined that the otherwise sluggish public conscience will be awakened to the importance of considering seriously the question of health as influenced by a clean mouth and well-cared-for teeth. It is generally conceded that the public is in a receptive mood regarding those things which make for health, if the presentation is of such character as to carry conviction and is forceful enough to make them think and to include themselves in the analysis. The whole idea of

public dental education and public dental service is so large, its influences are so far-reaching that one approaches the subject with careful deliberation because of the importance of carrying on properly this duty which belongs to us as dentists. As our contribution to good citizenship, we must realize that dental education for the public is not giving them a luxury but rather supplying them with a crying necessity. Dr. Buckley has illustrated the necessity of an inclusion of dental service. He vividly painted word pictures on many situations that but require the touch of the individual imagination to fill in the title space. But how is all this to be accomplished? Before answering, let us ask another question: As dentists, what are we *giving* to our communities in a professional way? What are we doing to aid in making better men and women for tomorrow of the children of today? If we can satisfy ourselves that we fully appreciate this as our responsibility, have been accepting it as a part of our duty and have not been shirking it or neglecting it entirely, then we will be in a position to further consider the accomplishment of this great work. A true appreciation of the proportion of the undertaking must be realized in order that genuine good will result. Harmony of thought and hearty cooperation of the entire membership of our State Society are also a necessity. Every member must feel his responsibility and be willing to contribute not only his ideas, but also, if required, some of his time, and, should the urgency require, money, that the importance of the movement may be recognized and appreciated by such other departments of the state as might be interested in public health and hygiene. May I suggest that, in any program we are inaugurating for the furtherance of public dental service, we include and emphasize the importance of:

1. Maintaining the deciduous arch.
2. Discouraging the ruthless extraction of the first permanent molars.
3. When possible, including an orthodontic department. In certain types of case, for the proper application of that service which we desire to render, it will be impossible without the cooperation and assistance of this specialty of our profession.

Sidney J. Rauh, Cincinnati, Ohio: The idea of conducting a symposium along the lines of this one is timely, for there is a continued and growing demand for methods of reaching the dentist and, through him, the people, in a broader educational program for prevention. When health weeks, health shows and similar intensive campaigns are suggested, it must be definitely borne in mind that, without some sort of existing organization, little will be accomplished. In fact, in an unorganized community, the best that can be hoped for is that an interest may be aroused which may lead to better things. For example, several years ago, a health show was held in Cincinnati. It lasted about a week. I was a member of the general board which conducted the exhibit and was in close touch with its activities at all times. The original suggestion preceded the consummation of the idea more than a year. Paid workers and volunteers from practically every health organization in the city gave of their time and energy, and, for a few weeks before, practically all health work in Cincinnati was concentrated on the exhibit. The crowds were so large that it was impossible to reach the spectators more than casually. If the same amount of energy and expense had been employed in direct work through various agencies, more lasting results would have been possible. The dentist must learn that only through thorough cooperation with all organizations can he hope to put his work upon a proper basis, and, at the same time, it must remain distinct or it will be swallowed up by the enthusiasm of other specialists. A problem which has arisen in recent years concerns the employment of dental students for prophylactic and some corrective work. This plan has both good and bad features. Certainly when students are allowed to undertake operations, however simple, careful supervision is necessary lest abuses creep in and the movement be discredited.

At the meeting of the American Academy of Periodontology held last week, there was a decided sentiment on the part of many of its members in favor of curtailing the scope of the dental hygienists' work, for the reason that their knowledge and experience was not great enough to enable them to perform their duties properly. The dental student of today is too busy with matters pertaining to his education, so that unless he has a rather broad vision,—and this is too much to expect from an undergraduate—it will only be through extraordinarily good supervision that proper care of the patient can be secured. If we could have men of the type of Dr. Buckley directing, the result would not be in doubt.

Furthermore, it must be recognized that one of the most important functions of these students is to implant the educational idea in the minds of their little patients; scarcely a task for undergraduates. The program at this meeting brings out a highly interesting fact. The essayists, Drs. White and Hollister and Miss Schmidt, are paid workers; Dr. Buckley is concerned with college work, which puts him practically in the same class. This is a most excellent and desirable state of affairs, for it demonstrates that the work has been put upon a basis where it will be permanently supported and further that the minds of these professionals are concerned almost entirely with the oral hygiene problem. This state of affairs necessarily will more quickly develop methods and plans which can be used by other communities. It is highly important that the volunteer be encouraged at all times, for it is only through a combination of the two forces that progress will be made. The volunteer works best when he is new and enthusiastic; the professional plugs along; and one stirs up the other. Through our work, we have developed and will develop much enthusiasm and assistance by educating and cooperating with all health agencies, dental hygienists, nurses, social workers, etc. It is necessary that the American Dental Association or some other organization develop a strong central bureau which can evaluate and supply slides, pamphlets, programs for campaigns, etc. A beginning has been made by the American Dental Association, but if we are to impress the dental profession the Association must supply at least an equal amount of funds for this bureau as it does for any other branch of dental activity that it supports. Thirteen years ago, an international congress on hygiene was held in Washington, after the national meeting, and not a single paid worker attended. Now, among my personal acquaintances in attendance here (and there must be many unknown to me) are: Drs. Cross of the Forsythe Infirmary, Boston; H. J. Burkhart of the Rochester Dispensary; Hollister of State Department of Health, Pennsylvania; Hyatt of the Metropolitan Insurance Company, New York; Buntin of the Cincinnati Dental Hygiene Society; White of Minneapolis; H. R. C. Wilson of Cleveland and Quinby of the Forsythe Dental Infirmary, Boston; and Miss Schmidt of the American Dental Association, all to be classed as professionals. This is a decided step forward and demonstrates that we are making real progress.

L. Pierce Anthony, Philadelphia, Pa.: In the limited experience that I have had with the practical side of dental education of the public, I am convinced of the truth of Dr. Buckley's statement, or rather philosophic conclusion, in the opening paragraph of his paper; namely, that dental education in recent years has been directed to the more materialistic phase with lack of proper attention to the social and moral phase. In our endeavors to prosecute a dental educational campaign in Philadelphia, we have been forced to a realization that the dental profession itself is more in need of education as regards its sense of obligation to the public than is the public with regard to its dental needs. Truly all economic, industrial and humanitarian progress emanates from moral and cultural impulses, and these impulses seem not to be developed in the profession as a whole. The main objective seems to be materialistic; hence the slow progress of preventive dentistry. The desirability of education of the public along dental health lines needs no argument, as its value has long since been amply demonstrated. Our next step, it seems to me, is educating not the masses, but the dentist, medical man and the philanthropically inclined layman, in order to supply the physical, moral and financial sinews of war for oral health. I can only commend in highest terms Dr. Buckley's work, and I regret the fact that men of his type are so conspicuously few. He has proved what one man can do, and has proved to himself and others that, rather than being a burden, the work affords much pleasure and satisfaction in the joy of doing for others. It occurs to me that his plan offers a very practicable working scheme for all cities in which dental schools are located. The results of such work as his cannot but prove of immense benefit to the public, and indeed the results are already being appreciated in Los Angeles. One of the results of our activities in preventive dentistry has been to prove beyond question its economic desirability; the purpose now should be to get this lesson home to those we can interest in civic dentistry. We have proved to ourselves that prevention in dentistry is even more effective and necessary than in medicine. The rather discouraging fact we have discovered is that preventive dentistry, to be most effective, must begin in the prenatal period because of the fact that the tooth is a completed end organ and its destiny seems to be determined when it is erupted or even before. The encouraging feature, however,

is that the benefits of our efforts with the children of today must, in the nature of the case, be cumulative; hence, the education of the child today means the prenatal application of this education in the generations to follow. Dr. White is to be highly commended on the enthusiasm with which he and his confréres have prosecuted an ingenious and no doubt successful plan. If more local societies could be brought to a realization of the benefits to be gained from campaigns such as that being conducted under the supervision of Dr. White, the profession would make further and effective strides toward the attainment of preventive dentistry. We have the various avenues for dental education, but I believe the most effective, and the one that will bring more lasting benefits, is the school. A most commendable slogan for oral hygiene education as suggested would be, "The child's health, the foundation of his welfare and success." Dentistry, as compared to medicine, has often been charged with a lack of interest in public welfare, and here I believe we have the field where we can most admirably fulfil our mission as a profession and at the same time amply meet our moral and civic obligations to humanity in general. Dr. Hollister's health week campaign in Pennsylvania has been productive of excellent results. He has met a lack of interest in some quarters, but his perennial enthusiasm and his most effective methods of procedure are producing results that are being recognized throughout the state as most beneficial not only to the public at large but also to the dental profession generally. May I again repeat the thought that it seems most desirable and necessary at this time to educate the dentist in his moral obligation to the community.

DENTAL EDUCATION

A RADIO TALK

By HENRY L. BANZHAF, B.Sc., D.D.S., F.A.C.D., Milwaukee, Wisconsin
Dean of the Marquette University Dental School

THE dental profession has been making remarkable progress during the past five or ten years. This is particularly noticeable to anyone who has attended the recent meetings of the American Dental Association which is enjoying the hospitality of the people of this beautiful city of Louisville this week. The attendance here at this meeting has exceeded all expectations, the weather is delightful and everybody is happy. I suppose that some of you who are listening in and whose dentists are attending this meeting are happy too. I hope your teeth won't act up until your dentist gets back. Anyway, here's hoping. If there are dentists listening in who are not at this meeting, I want to say to you "Boys, you are missing a great meeting. The interest shown here is keen and the enthusiasm is wonderful—and this enthusiasm is the natural kind, too."

Dentists are becoming more skilful in their reparative work and in replacing missing teeth, and more certain in their treatment of diseases of the teeth and adjacent parts. But among the greatest forward strides of recent years is the fact that the profession is taking more and more interest in the problem of prevention of disease. The importance of the work that the dentist and dental hygienist are doing in the field of preventive dentistry is something that I always like to emphasize. More and more people are beginning to learn that a clean mouth is essential for a healthy body and to appreciate the health service that is offered by the dental profession.

While I should like to elaborate on this thought, it has been suggested that

I tell you in a few words something of the present condition of dental education in this country, and I am very glad to comply with this request. All of my listeners are interested in schools and education in general, and no doubt are curious as to the nature of dental education.

There are at the present time forty-three dental schools in the United States. The schools are rated class A, B, and C by a governing body called the Dental Educational Council of America. Although standards have been constantly raised, I am glad to say that twenty-six of these schools are now rated class A and only two are rated class C. The fact that dental schools have been rated since 1918 has forced a number of the weakest ones to discontinue.

In order to be looked on with favor, the dental school of today must be owned and conducted by a bona fide university, and there are few exceptions to this rule at present.

Ten years ago, the dental course was but three years in length and was based upon a high school education. Today, most dental schools already require a five year course after high school graduation. The lengthening of the course has been the direct result of progress in the profession.

In 1921, the trustees of the Carnegie Foundation, realizing the tremendous importance of dental service to the general health of the people, invited the Dental Educational Council to collaborate with the Foundation in a study of dental education with a view to its further improvement. The fact that this powerful Foundation, which has done so much for medical education, is now interesting itself in dentistry is in itself significant.

As a result of this four years of intensive investigation, the Foundation has made a number of important recommendations, which I cannot, in the few minutes, at my disposal, take time to discuss. The one that will interest you most is the recommendation that relates to the organization and arrangement of the dental curriculum. All dental schools will be operating under its provisions in the near future. According to this plan, the dental student will, after graduation from high school, enter a college of liberal arts, where he will enroll for two years in a study of the fundamental sciences, such as physics, chemistry, and biology, upon which dentistry is founded, and also a number of necessary cultural, yet highly practical courses, such as English, higher mathematics, foreign languages, ethics and psychology. These courses build the student's character, prepare him for his professional studies and thoroughly test his ability.

After this two-year course, the student may decide whether he wants to enter dentistry or medicine.

After completing the two preliminary college years, the student enters his professional studies, which he completes in three years; making a total of five years for the entire course. During these three years, the student is instructed in the medical sciences, such as anatomy, bacteriology and pharmacology, as well as in the practical work of dentistry and dental technic, such as that of bridge work and denture work.

At the end of the five years, the student has completed the requirements for the degree of Bachelor of Science as well as that of Doctor of Dental Surgery.

Being possessed of the Bachelor's de-

gree, the student may, if he elects to do so, return to school for an additional year of graduate work and perfect himself in some specialty of dentistry, such as oral surgery. At the end of this graduate year, he would receive the degree of Master of Science. He might even continue his graduate studies until he has received the highest degree of all, the degree of Doctor of Philosophy.

This plan of dental education is called the two-three-graduate plan and you can see from my explanation why this is a good name for it.

I wish I had time to explain its many advantages, but my time is up. The point I want to stress again is that great improvements have been and will be made in dental education. Dentistry will maintain its place along with medicine, the ministry and the law, as one of the learned professions.

DENTAL HYGIENE REPORT

The Promotion of the Welfare and Hygiene of Maternity and Infancy.

The act for the promotion of the welfare and hygiene of maternity and infancy, passed by Congress, Nov. 23, 1921, which is properly known as The Shepperd-Towner Act, makes available to the states, if matched by state funds, federal aid for reducing maternal and infant mortality and promoting the health of mothers and infants. At the close of the fiscal year 1924, forty states were cooperating under the provisions of the Act. Several of these states are conducting noteworthy work in dental hygiene. A report of this phase of the work taken from the bulletin on "The Promotion of the Welfare and Hygiene of Maternity and Infancy," published by the U. S. Department of Labor, Children's Bureau (Publication No. 146) is as follows:

"Some states note that dental attention was included in the child-health conferences held. Others report that the inspection of children by nurses included sufficient observation of the teeth to determine that the child should be referred to a dentist. Dental clinics or conferences have been specifically reported by only ten states. Over 11,000 children received examination. In addition to the twenty-eight dental conferences (with a total of 1,120 children examined) which California reported, a special campaign for the complete physical examination of preschool children (see p. 22) was made possible in this state by the cooperation of dental as well as medical organizations. The dental hygienist on the staff is reported to have done successful work and to have been instrumental in obtaining dental clinics. All corrective work was referred to the local dentists.

"In Indiana 1,649 children were examined and the cases (1,519) of decayed teeth noted; instruction on the care of the teeth was given in mothers' classes, and a chart was exhibited showing the relation between nutrition and the development of teeth. An educational film dealing with the care of the teeth was shown in Indiana and a number of other states. Although Michigan made no special report concerning dental conferences or clinics, statistics on defects noted during physical examinations at health conferences were recorded. New Jersey reported accomplishing dental care for 1,300 children through its two clinics and traveling dental ambulance. In Pennsylvania the State division of dental hygiene cooperates with the preschool division of the bureau of child health by detailing two members of its staff to give full time to work among preschool children and prenatal cases, while thirty-eight members of the staff gave part time. West Virginia had a dentist at every child-health conference during four weeks of intensive work in four counties. Iowa has a dental adviser upon the administrative staff. An exhibit on oral hygiene was prepared and used especially at the meeting of the state dental society. It was noted here that defects of the teeth, although found among the four chief kinds of defects noted in the examination of children (diseased tonsils, malnutrition, adenoids, defects in

teeth), are nevertheless practically 100 per cent correctible.

"The problem of the expense involved in dental treatment was partly solved in South Carolina by charging each child treated the nominal sum of 50 cents, though the work done in many cases was actually quite costly. The state dental association furnished a dentist, who organized the work in a county with the county nurse and the local physicians. The county wishing the work done contributed a sum of money, and the state dentist assigned a dentist to do the work. In Virginia the dentist on the staff works in cooperation with the state dental association and submits all plans to the dental member of the state board of health for approval. Dental clinics were held by the state in the summer, and a dentist attended the child-health conferences. Altogether, dental care was given to sixty-nine mothers and 848 children. Since seventeen counties have no resident dentists the child-hygiene division has been trying to create a demand for dentists, and the local dentists, in fact, seemed to have more work than ever before."

DENTAL HEALTH TALKS FOR LAY AUDIENCES

The Public Service Committee of the Chicago Dental Society, in connection with the mouth hygiene campaign being carried on by the Chicago Dental Society and the Illinois State Dental Society, ran a national contest, recently, for the best twenty-minute dental health talks for lay audiences.

Fourteen of the best papers received were selected and have been printed, separately, in pamphlet form. In this series, there are talks suitable for: parent-teacher associations, high school groups, radio audiences, church audiences, industrial groups, service clubs, such as Rotary and Kiwanis, and primary grades groups.

Any of these "Talks" or all of them may be obtained at the Department of Dental Health Education, American Dental Association, 58 E. Washington St., Chicago. Price, 5 cents a copy; 50 cents a set.

F. BLAINE RHOBOTHAM, *Chairman*,
Public Speaking Committee.

HEALTH PLAYS AVAILABLE

Three dental health plays, excellent for school use, can be obtained from the Department of Dental Health Education, American Dental Association. Price 5c each.

Scene from the dental health playlet "Stepping Stones to Happiness."

Tooth Truths, by Armin P. Baur, D.D.S.

The Bad Baby Molar, by Lon W. Morrey, D.D.S.

Stepping Stones to Happiness, by Lon W. Morrey, D.D.S.

TENTATIVE PLANS FOR ORAL HYGIENE WORK IN MICHIGAN

Dr. William R. Davis, recently appointed director of the bureau of oral hygiene and preventive dentistry of the Michigan department of Health, has outlined the following as an initial and somewhat general policy for his department.

I. (1) Get as much information as possible about plans and programs of oral hygiene now in operation.
   (2) Develop in the bureau at Lansing suitable educational material.
      (a) For use at fairs, farmers' institutes, parent-teacher association meetings, etc.
      (b) Slides, films, etc., for lecture work.

(c) Suggested programs for school clinics for different localities—city, small town, rural, county, etc. This would also include suitable cards for examinations, records, etc.

(d) Essential outfit for hygienist.

(e) Essential outfit for dentist. (Frequently school boards and other organizations contemplating starting a clinic expend money needlessly for nonessentials and do not have the essentials. Equipment and blanks should be standardized.

(f) Develop models showing various types and procedures in children's dentistry for use in dental meetings, with directions and cautions for new operators in children's dentistry.

II. Gather data as to cost per child, according to school census, of various types of oral hygiene work and results obtained as shown by actual school examination, noting how much each type has improved conditions according to cost per child. Figures and statistics mean little. The important items are cost and results, according to some standard.

III. (1) Make actual demonstration of benefits from good mouth conditions in certain schools where favorable support can be secured.

(2) Work out plans and put in operation whatever field work seems practical.

IV. Be available for a reasonable amount of speaking before clubs, associations, dental meetings, etc.

V. Supervise dentistry in state institutions.

Scene from dental health playlet "The Bad Baby Molar."

Dr. Davis recommends that the work be developed slowly enough to be built on a solid foundation, realizing that this is not a program for one year but for a number of years,

and that other than a solid foundation may be disastrous in the long run.

He recommends further that close relations be maintained with other branches of public health activities, since oral hygiene is just one branch of public health.

STIMULATING INTEREST IN DENTAL HEALTH

A new device for stimulating school children to have dental defects corrected comes from Pennsylvania. Great interest and gratifying results are reported.

AN OPEN LETTER
to
Miss Marion Arnold and Miss Ruth Vanderford,
Dental Hygienists,
West Shore District,
Cumberland County, Pa.

Ladies:

The splendid dental hygiene work that you are accomplishing among children of Camp Hill, Lemoyne, New Cumberland, Wormleysburg, West Fairview and East Pennsboro Township, is deserving of public appreciation.

To encourage the school children in your district to have their dental defects corrected, we offer a free ticket to the Vanishing American at the Victoria Theater, Harrisburg, to each child whose name appears on the dental honor roll prior to the appearance of that wonderful educational picture, week of February 22.

In addition we desire you to announce to your schools that we will entertain as our guests in the new State Theatre, Harrisburg, the entire school room which is first to register 100 per cent on your honor roll.

Yours very truly,
Wilmer and Vincent.

FIELD NOTES

The County Council of Marion County, Ind., has made an appropriation to start a dental clinic in the county schools. This is a direct result of the examination conducted by the members of the Indianapolis Dental Society, about one year ago.

Cooperation, vision and good organization seem to be the outstanding features of the dental work at Pontiac, Mich. This work was organized and is conducted by the board of education, department of health and county Red Cross. Dr. P. B. Jones, the school dentist, in a recent report, mentions the splendid cooperation of dentists in private practice, teachers, principals and school nurses. Six schools are equipped with dental chairs, so that the dentist serves the schools in rotation rather than having the children leave the school and come to a central office. Every fall, a survey is made by the dentist and his assistant. A mirror and explorer are used, and cavities, abscesses and occlusions are noted, as well as the cleanliness of the mouth. On Saturday mornings, a clinic for the preschool child is held at the central clinic of the health department. Every afternoon from 4 until 5 o'clock, Dr. Jones is at this clinic. There he cares for the emergency cases referred from all of the schools by the school nurses. All dental work is restricted to indigents. Dr. Jones lectures to civic and health groups and has established a 100 per cent dental room. All children whose mouths need no care at the time of the annual survey are permitted to place their names on a large white card on the wall—the honor roll. As the remaining children have their dental defects corrected, either by a private dentist or the school dentist, their names are added. When everyone's name is on the list, the cardboard is removed and replaced by a large black felt banner with orange letters, reading "Dental Honor Room." Last year, there were twenty-four 100 per cent rooms.

Medical and Dental News

California

Southern California Dental Association Meets: The annual meeting of the Southern California Dental Association was held in Los Angeles, February 1-2, at the College of Dentistry of the University of Southern California. Dr. Frank W. Chandler, of Hollywood, gave a clinic in oral surgery, on Monday, and Dr. Lewis E. Ford took part in Tuesday's program. Dr. Floyde Eddy Hogeboom is the new president of the association.

Colorado

Four-Day Clinic of Rocky Mountain Dentists: A four-day session of clinics was held, beginning January 20, at Denver, under the auspices of the Denver Dental Association. Dentists attended from Colorado, Utah, Wyoming, Nebraska, Kansas, Oklahoma, South Dakota and Montana. Drs. DeForest Davis, Minneapolis, William L. Shearer, Omaha, Polk E. Akers, Chicago, Vern J. Smith, Los Angeles, and Biley Smith, Philadelphia, took part in the program.

Connecticut

Dinner to Dr. Prentis: A dinner in honor of Dr. Edward Prentis, of New London, on the fiftieth anniversary of his entry on the practice of dentistry, was given at the Thames Club, New London, January 23, under the auspices of the New London County Dental Association. About forty members of the state association were present. Dr. Prentis was presented with fifty dollars in gold.

Georgia

Convention of Second District Dental Society: The annual convention of the Second District Dental Society was held, January 28-29, at Albany. At the first session, Dr. J. R. Mitchell, of Atlanta, discussed "Bridgework with Vital Abutments," and Dr. I. M. Hair spoke on "Impressions and Full Dentures." Dr. Hair spoke on "Taking Impressions and Bites for Full Dentures," at the next session, and Dr. Mitchell on "Preparing Abutments and Making Hoods and Inlays on Vital Teeth." Drs. Hair and Mitchell spoke at the second day sessions also. A banquet was given in the evening of the first day of the meeting.

Idaho

Southwestern Dental Society Meets: The regular monthly meeting of the Southwestern Idaho Dental Society was held, January 12, with a banquet, after which Dr. H. P. Belnap, M.D., of Nampa, spoke on "Focal Infections and Their Relation to Dentistry."

Illinois

Southern Illinois Dental Society to Meet: The Southern Illinois Dental Society is to meet in Frankfort, March 9-10. More than a hundred members are expected to attend. On the program are Drs. P. G. Puterbaugh and R. E. McBoyle, and Miss Evelyn C. Schmidt, director of the Dental Health Department of the American Dental Association, all of Chicago. Following the program, there will be a banquet and entertainment at the Franklin County Club. The officers of the society are: president, J. M. Marberry, Carbondale; secretary, K. K. Kelly, Anna.

Madison County Dental Society Meets: The district meeting of the Madison County Dental Society was held, February 3, at Alton. Clinics were conducted by Drs. R. C. Seibert and George B. Scott, of St. Louis, Thomas E. Prosser, East St. Louis and E. L. Burroughs, Edwardsville. Dr. B. O. Haun, St. Louis, read a paper on "Balanced Occlusion."

Dental Health Statistics: The following figures were presented recently by Dr. Isaac D. Rawlings, state commissioner of public health, regarding dental health conditions: school children needing corrective dental

work, 400,000; school children having one or more dental cavities, 950,000; school children needing semiannual cleaning and polishing of teeth, 1,000,000; adults needing one or more teeth filled, 3,000,000; adults needing annual cleaning and polishing of teeth, 3,000,000; adults needing bridge, crown or plate, 2,500,000.

Societies to Affiliate: It is reported that the counties of Logan, Sangamon and Menard plan to affiliate in organizing a central Illinois society.

Mid-Winter Clinic of Chicago Dental Society: The sixty-second annual meeting for the mid-winter clinic of the Chicago Dental Society was held at the Drake Hotel, January 27-29, with an attendance of between 6,500 and 7,000. The first general session was a joint meeting of dentists and physicians to discuss health problems and the dental aspects of disease. Dr. William D. Haggard, president of the American Medical Association, spoke on "Teamwork for the Health of the People," and Dr. Sheppard W. Foster spoke on "A Dental Educational Program." The annual banquet and dance was given on Thursday evening, January 28.

Dr. and Mrs. Foster Honored: Dr. Sheppard W. Foster, of Atlanta, Ga., president of the American Dental Association, and Mrs. Foster were the guests of honor at the banquet and dance of the Chicago Dental Society, held in connection with the Mid-Winter Clinic, in the Gold Ballroom of the Drake Hotel, January 28. Dr. M. M. Prinz, president of the Chicago Dental Society, was toastmaster. Dr. Charles N. Johnson, of Chicago, past president of the American Dental Association, the Rev. John Timothy Stone, of Chicago, and Dr. DeLos L. Hill, of Atlanta, Ga., spoke. Dr. and Mrs. Foster responded. Dr. Gail M. Hambleton, of Chicago, sang a group of songs. An honorary membership in the Chicago Dental Society was presented to Dr. Foster, and he and Mrs. Foster were the recipients of a silver service from the faculty of the dental department of Loyola University.

Indiana

Northwest Indiana Dental Society Meets: The Northwest Indiana Dental Society held its district meeting in Hammond, January 15. At the morning session, Dr. William E. Harper, of Chicago, spoke on "Our Amalgam Failures;" and in the afternoon Dr. Sherman Davis, of the University of Indiana, spoke on "Deficiency Diet and Degenerative Diseases." The officers of the society are: president, A. P. Craig, Gary; vice president, C. E. McCready, Gary; treasurer, G. S. Hilliard, Whiting; secretary, A. P. McConnell, Hammond.

Iowa

Dr. Plagman in Reserve Corps: Dr. A. A. Plagman, of Davenport, has been appointed first lieutenant in the dental reserve corps of the United States Army.

Sioux City Society Meets: The regular monthly meeting of the Sioux City Dental Society was held, January 12, with an attendance of fifty members. Dr. W. G. Rowley, M.D., gave a talk on "Chemical Indications of the Blood."

Louisiana

Work of Tulane Dental Clinic: By an arrangement with the school board, the Tulane Dental Clinic cares for grammar school children who are unable to pay for dental work, for the nominal charge of 25 cents. Two hours a day is given to the work, except on Saturday. In addition to the school work, the clinic renders service to the following institutions of charity: Milne Home, St. Anna Asylum, Home for Incurables, Parish Prison, Society for Prevention of Cruelty to Children, Jewish Charitable and Educational Federation and Charity Organization. The clinic is open throughout the year.

Michigan

Benton Harbor Clinic: Through the efforts of the Tri-County Dental Society, a dental clinic will be held each Wednesday, for the examination of the teeth of school children. The Tri-County Society is composed of dentists from Berrien, Cass and Van Buren counties. The members are working toward the establishment of dental clinics in every community in each county.

Missouri

Mr. Sutton Speaks in St. Louis, Mo.: Mr. Willis Sutton, superintendent of the Atlanta, Ga., public schools, spoke recently to the pupils of Soldan High School, under the auspices of the St. Louis Dental Society, the St. Louis Board of Education, the American Red Cross and the Community Council. He spoke on dental health education for children both as a humanitarian and as an economic measure.

Kansas City Dental Society Meets: The Kansas City Dental Society held its regular

monthly meeting, January 12. One hundred and fifty members were in attendance. Dr. H. J. Prentiss, professor of anatomy of the University of Iowa, was the essayist of the evening.

Montana

Eighth District Dental Society Elects Officers: The following have been chosen officers of the eighth district dental society: president, Frank J. Hemmer; vice president, J. B. Driscoll; secretary-treasurer, C. N. Bucher; all of Butte.

New York

Endicott Johnson Dental Department Entertains Dentists and Physicians: As part of its mid-winter program, the Endicott Johnson Dental department gave a reception and dinner to the Binghamton Dental Society, and the Endicott Johnson Medical Society, as well as other guests from among the medical specialists of the community, with the idea of promoting closer cooperation between dentists and physicians. Following a dinner at "Your Home Library," Johnson City, N. Y., Jan. 12, 1926, Dr. Robert H. Ivy, professor of maxillofacial surgery of the Graduate School of Medicine, and of clinical maxillofacial surgery in the Dental school of University of Pennsylvania, gave a paper on "Oral Surgery of Interest to Dentists and Physicians." Dr. Ivy's paper stressed the importance of oral hygiene and the necessity of the dentist and physician working together in many conditions, emphasizing empyema of the antrum, jaw fractures, plastic surgery, dental abscesses and osteomyelitis.

Ohio

Work of Cleveland Mouth Hygiene Association: The annual report of the Cleveland Mouth Hygiene Association shows that 29,515 children received free dental operations during 1925 in clinics maintained at three city health centers and two parochial schools. It is reported that commencing March 15 all dental operators in the health centers will receive their salaries from the city health department, and will be placed on a full-time basis. The Community Fund has granted an appropriation of $11,733 for the work of the association during 1926.

Dental Society Reorganizes: During the month of January, the reorganization of the Butler County Dental Society was effected.

Work of Dispensary Increasing: The number of patients visiting the Toledo Dental Dispensary maintained by the Toledo community chest increased 525 in 1925 over the attendance of the preceding year, 3,559 being cared for. Patients are referred to the dispensary by public agencies and the schools. The salary of one of the dentists is paid by the board of education.

Oklahoma

Northwestern Society Elects Officers: The following were elected officers of the Northwestern Oklahoma Dental Association: W. O. Halderman, Enid, president; F. C. Gale, Pond Creek, vice president; J. C. Devin, Cherokee, secretary.

Nebraska

Lincoln Dental Society Meets: The Lincoln Dental Society held its regular monthly meeting, January 18. Dentists from all over the state were invited to attend. The essayist was Dr. George A. Thompson of Chicago, who spoke on the use of porcelain.

New Hampshire

Cheshire County Society Formed: Sixteen dentists met, January 7, at Keene and formed the Cheshire County Dental Association. Dr. Louis G. Barrett was elected president and Dr. George J. McCushing, secretary.

Pennsylvania

Central Pennsylvania Society Meets: The Central Pennsylvania Dental Society met at Johnstown, February 22-24, in annual conference. Dr. Stewart L. McCurdy, professor of anatomy and surgery in the Dental Department of the University of Pittsburgh, conducted a clinic.

Scranton District Dental Society Meets: The Scranton District Dental Society held their sixth annual banquet, January 25, with a program of addresses and entertainment. Dr. D. S. Gardner is the retiring president and Dr. John J. Brogan, president elect.

Harris Dental Society Meets: The Harris Dental Society of Lancaster, held its sixtieth annual banquet and meeting, January 19. The following were elected officers for the ensuing year: president, J. P. Waterson; vice president, F. F. Fish; secretary, Paul E. Bomberger; treasurer, L. E. Nightengale.

Lycoming Dental Society Meets: The annual meeting and banquet of the Lycoming Dental Society was held, January 12, at Williamsport. C. J. Hollister, chief of the dental division of the state department of health, gave the principal address of the evening.

North Philadelphia Dental Surgeons Meet: At the annual meeting and banquet of the North Philadelphia Association of Dental Surgeons held at the Majestic Hotel, Philadelphia, Pa., on January 13, 1926, the following officers were elected for the ensuing year: president, Elmer E. Henry; vice president, William T. Wyckoff; secretary, Warren Matlack; treasurer, John H. Yearick; editor, J. Iredell Wyckoff.

Rhode Island

Westerly Plans Clinic: As a result of a report of the dental inspector of the Westerly public schools, showing the need for more attention to this phase of health work, the school committee has decided to establish dental clinics for the pupils of the lower grades. A suitable clinic room will be provided in each school and equipment installed. The report of the dental inspector shows that of 1,861 grade children examined, only 174 were found to have sound teeth. The number with decayed teeth was said to be 1,661, and those with diseased teeth reached the total of 1,187. Treatment has been advised for 1,436.

Rhode Island Dental Society Meets: The annual meeting of the Rhode Island Dental Society was held at Providence, January 13-14. At the opening meeting, Dr. Frank W. Rounds, of Boston, spoke on "Exodontia for the General Practitioner." Dr. Wilfred Pickles, of Providence, assistant anesthetist at the Rhode Island Hospital, talked on "Physiology of General Anesthesia," and Dr. Harold DeWitt Cross, of Boston, on "Preventive Dentistry." The second day was taken up with clinics, followed by the annual banquet.

Texas

Central Texas Dental Society Meets: Sixty dentists attended the meeting of the Central Texas Dental Society, January 20, at Waco. Drs. S. E. G. McDonald, of Mart, Frank M. Robinson, of Temple, J. L. Curry, of Belton, and W. B. McCall, of Temple, took part in the program.

West Virginia

Huntington Dental Society Meets: At the regular monthly meeting of the Huntington Dental Society, the following officers were elected: president, A. F. Wallen; vice president, A. E. Wulfman; secretary-treasurer, S. M. Callaway. Dr. George M. Lyon, M.D., read a paper on "Diet in Childhood and Its Relation to the Teeth."

Wisconsin

School Clinic at Appleton: A school dental clinic was opened at the Lincoln School in Appleton recently, being sponsored by the city, the board of education and the Kiwanis Club.

General

Public Health Authorities Call Upon President Coolidge: President Coolidge, on January 14, interviewed a group of representatives of leading public health agencies who had proposed to him a rearrangement of some of the federal health activities. Those who called on the president were as follows: Dr. Lee K. Frankel, American Public Health Association; Prof. C. E. A. Winslow, American Public Health Association; Dr. Haven Emerson, Professor of Public Health, Columbia University; Dr. M. J. Rosenau, Professor of Preventive Medicine, Harvard Medical School; Dr. William F. Snow, American Social Hygiene Association; Dr. Linsly R. Williams, National Tuberculosis Association; James A. Tobey, Government Research. The recommendations that had been agreed upon at the last meeting of this group will be placed in a bill shortly to be introduced in Congress. The president was unwilling to give his view on the proposals until he had studied the bill to be introduced.—*Bull. Nat. Tuberculosis Ass'n.*, February, 1926.

Senator Shipstead Debates on World Court: Senator Shipstead (Minnesota) took the negative of a debate on the subject "Shall America Enter the World Court?" broadcast from Washington, January 26. Senator Walsh (Montana) took the affirmative.

Deaths

Drexler, John H., Miami, Fla.; Pennsylvania College of Dental Surgery, 1896; died, January 17, at Baltimore, Md.; aged 61. Dr. Drexler practiced in Frankford (Philadelphia) Pa., until 1920, when he moved to Miami. Here he retired after three years. He was the president of the North Philadelphia Association of Dental Surgeons in 1915-1916.

Gibson, Kasson Church, New York City; died, December 26; aged 76.

Leatherbury, Thomas Bagwell, Anoncock, Va.; Baltimore College of Dental Surgery, 1891; died, January 6, from pneumonia; aged 58.

Patzold, Hugo L., Hartford, Conn.; died, January 22; aged 57.

Totten, Charles B., Hartford, Conn.; died in New York City, January 20; aged 41.

Announcements

CALENDAR OF MEETINGS

NATIONAL SOCIETIES

American Association of Dental Schools, March 24-26, 1926, Chicago, Ill.

American Dental Golf Association, August 23, 1926, Philadelphia, Pennsylvania.

American Dental Hygienists Association, August 23-28, 1926, Philadelphia, Pennsylvania.

American Dental Society of Europe, April 5-7, 1926, Nice.

American Medical Association, April 19-23, 1926, Dallas, Texas.

American Society of Orthodontists, August 16, 1926, New York City.

International Orthodontic Congress, August 16-20, 1926, New York City.

Pacific Coast Dental Conference, June 21-26, 1926, Portland, Oregon.

Seventh International Dental Congress, August 23-28, 1926, Philadelphia, Pennsylvania.

Canadian Dental Association, August 16-19, 1926, Halifax, N. S.

STATE SOCIETIES

District of Columbia, at George Washington University, Washington, D. C., second and fourth Tuesdays in each month from October to June, inclusive.

National Capital at Washington, D. C., first Tuesday of every month.

March (1926)

District of Columbia, at Washington, D. C. (24-26).

Louisiana, at New Orleans (3-6).

April (1926)

Alabama, at Birmingham (5-7).
Connecticut, at Bridgeport (8-10).
Kansas, at Wichita (19-21).
Kentucky, at Louisville (5-7).
Michigan, at Detroit (12-14).
Mississippi, at Meridian (13-15).
New Jersey, at Trenton (14-17).
North Carolina, at Richmond, Va. (13-15).
Oklahoma, at Tulsa (27-30).
Texas, at Wichita Falls (27-29).
Virginia, at Richmond (13-15).

May (1926)

Arkansas, at Little Rock (17-19).
Illinois, at Springfield (11-13).
Indiana, at Indianapolis (17-20).
Iowa, at Des Moines (4-6).
Maryland, at Baltimore (3-5).
Massachusetts, at Boston (3-7).
Missouri, at Jefferson City (17-19).
Montana, at Helena (26-28).
Nebraska, at Lincoln (17-20).
New York, at New York City (19-22).
North Dakota, at Grand Forks.
South Carolina, at Columbia.
South Dakota, at Sioux Falls (11-13).
Southern California (17-20).
Tennessee, at Nashville (4-7).
Vermont, at Burlington (26-28).
West Virginia, at Clarksburg (17-19).

June (1926)

California, at Portland, Ore.
Colorado, at Colorado Springs (9-12).
Georgia, at Savannah (9-11).
Maine, at Augusta (last week).
New Mexico, at Santa Fe (10-15).
Oregon, at Portland.
Washington, at Portland, Ore. (21-26).

July (1926)

Wisconsin, at Milwaukee (13-15).
Wyoming, at Lander (12-13).

August (1926)

Pennsylvania, at Philadelphia (23-27).

October (1926)

Florida, at Daytona.

November (1926)

Arizona, at Phoenix.

December (1926)

Nevada, at Reno (4).
Ohio, at Columbus (7).

Dental Hygienists Association of the State of New York, at New York City, May 20-22, 1926.

Loyola University Dental Department Homecoming, Chicago, April 12-13, 1926.

MEETINGS OF STATE BOARD OF DENTAL EXAMINERS

Indiana, at Indianapolis, June 14, 1926. Secretary, J. M. Hale, Mt. Vernon, Indiana.

Massachusetts, at Boston, March 15-18, 1926. Secretary, W. Henry Grant.

Montana, at Helena, July 12-16, 1926. Secretary, Marshall E. Gates, Helena, Montana.

New Jersey, at Trenton, June 28-July 3, 1926. Secretary, John C. Forsyth, 148 W. State Street, Trenton, New Jersey.

Oklahoma, at Oklahoma City, in June. Secretary, Charles A. Hess, Idabel, Oklahoma.

Rhode Island, at Providence, June 22-24, 1926. Secretary, Albert L. Midgley, 315 Butler Exchange Building, Providence, Rhode Island.

National Association of Dental Examiners, at Chicago, June 15-19, 1926. Superintendent of Registration, V. C. Michels.

MISSISSIPPI DENTAL ASSOCIATION

The Mississippi Dental Association will meet in Meridian, April 13-15, 1926.

W. F. BEAVERS, *Executive Committeeman*,
Meridian, Miss.

DISTRICT OF COLUMBIA DENTAL SOCIETY

The annual postgraduate clinic of the District of Columbia Dental Society will be held at the Raleigh Hotel, Washington, D. C., March 24-26, 1926. Class or group clinics are being arranged. Exhibitors will please communicate with

W. W. WYMAN, *Chairman*,
Clinic Committee,
724 Upshur St., N. W.,
Washington, D. C.

CONNECTICUT STATE DENTAL ASSOCIATION

The sixty-second annual meeting of the Connecticut State Dental Association will be held at the Central High School, Bridgeport, April 8-10, 1926.

R. H. W. STRANG, *Chairman*,
Publicity Committee,
886 Main St.,
Bridgeport, Conn.

NEW JERSEY STATE DENTAL SOCIETY

The fifty-sixth annual meeting of the New Jersey State Dental Society, will be held at the Stacy-Trent Hotel, Trenton, April 14-17, 1926.

The Society extends a cordial welcome to all ethical dentists.

PROGRAM

"A New Simplified Method of Partial Denture Construction."
By Polk E. Akers, Chicago, Ill.

"Diet in Relation to Health and Dentistry."
By Dr. Percy R. Howe, Boston, Mass.

"The Displacement of Fractured Roots."
By Fred D. Miller, Altoona, Pa.

CLINICS

"Extracting for the General Practitioner."
By Guy L. Haman, Reading, Pa.

"Porcelain Jacket Crowns and Removable Bridge Work."
By Carlisle C. Bastian, New York City.

"Gold Inlays With Porcelain Veneer."
By D. H. Baldwin, Peoria, Ill.

"A Study of the Internal Anatomy of the Teeth."
By M. T. Barrett, Philadelphia, Pa

"Root Canal Technic."
By M. J. Waas, Philadelphia, Pa.
"Ultraviolet Radiation in Oral Lesions."
By Fred W. Lake, Boston, Mass.
"Maxillary and Mandibular Cysts: Roentgen-Ray Interpretation."
By John H. Gunter and LeRoy M. Ennis, Phladelphia, Pa.

F. K. HEAZELTON, *Secretary*,
223 E. Hanover St.,
Trenton, N. J.

OKLAHOMA STATE DENTAL SOCIETY

The Oklahoma State Dental Society will meet April 27-30, 1926.

W. T. JACOBS, *President*,
Muskogee, Okla.

TEXAS STATE DENTAL SOCIETY
(Change of Date)

The forty-sixth annual convention of the Texas State Dental Society will be held at Wichita Falls, April 27-29, 1926. The outstanding feature of the meeting will be several clinic courses conducted by leaders in the profession.

J. G. FIFE, *Sec'y-Treas.*,
Medical Arts Bldg.,
Dallas, Texas.

WYOMING STATE DENTAL ASSOCIATION
(Change of Date)

The Wyoming State Dental Association will meet July 12-13, 1926, at Lander.

EARL ANDREW, *Secretary*,
Cheyenne, Wyo.

INDIANA STATE BOARD OF DENTAL EXAMINERS

The Indiana State Board of Dental Examiners will hold its next examination at the State House, Indianapolis, beginning Monday morning, June 14, 1926. It is of utmost importance that applicants confer with this office for information relative to this examination early, as applications properly made out and signed, photo and all credentials must be in the hands of the secretary-treasurer at least one week before examination. For further information and application write to

J. M. HALE, *Sec'y-Treas.*,
Mt. Vernon, Ind.

MASSACHUSETTS BOARD OF DENTAL EXAMINERS

The Massachusetts Board of Dental Examiners will hold an examination for registration for both dentists and oral hygienists in the City of Boston, Mass., March 15-18. Full information, application blanks, etc., can be secured at the office of the secretary, Room 146, State House, Boston. All applications must be filed at the office of the secretary at least ten days before date set for examination.

W. HENRY GRANT, *Secretary*.

NATIONAL ASSOCIATION OF DENTAL EXAMINERS

The next examination for license to practice dentistry in Illinois will be held June 15-19, 1926, at Chicago. For applications (which must be filed at least ten days before the examination) and other information, address the Department of Registration and Education, Springfield.

V. C. MICHELS,
Superintendent of Registration.

STATE BOARD OF REGISTRATION AND EXAMINATION IN DENTISTRY OF NEW JERSEY

The State Board of Registration and Examination in Dentistry of New Jersey will hold its regular examinations at Trenton, commencing June 28, 1926, and continuing for five days thereafter. The license fee is $25; reexamination fee, $10.

Practical tests required: Insertion of an approximal gold filling with the approximating tooth in position, compound approximal amalgam filling and a silicate filling, the candidate to furnish his own patient. Taking of impression, bite, selection of teeth, articulation, trial plate, the candidate to furnish his own patient. Practical examination in mouth diagnosis.

Attention is directed to the following quotation from the dental law of New Jersey: "Applicant shall present to said Board a cer-

tificate from the Commissioner of Education of this State, showing that before entering a dental college he or she had obtained an academic education consisting of a four-year course of study in an approved high school or the equivalent thereof."

In accordance with this law, the secretary will issue application blanks only on presentation of the required certificate from the Commissioner of Education, State House, Trenton, N. J.

Candidates are to be given the privilege of appearing at four examinations during a period of three years. On failure to be eligible for a license after four examinations, they shall be required to take the entire examination over and on further failure to secure a license after four more examinations during a period of three years, they shall be ineligible for further examination.

Application must be filed, complete, ten days before the date of the examinations.

Address all communications for further particulars to

JOHN C. FORSYTH, *Secretary*,
148 W. State St., Trenton, N. J.

RHODE ISLAND BOARD OF REGISTRATION IN DENTISTRY

A meeting of the Rhode Island Board of Registration in Dentistry for the examination of candidates will be held at the State House, Providence, June 22-24, 1926, beginning each day at 9 a. m. Candidates shall present to the secretary of this board, at least one week before the examination, a written application on a form provided by the board, together with the examination fee of $20.00.

ALBERT L. MIDGLEY, *Secretary*,
315 Butler Exchange Bldg.,
Providence, R. I.

AMERICAN DENTAL HYGIENIST'S ASSOCIATION PRELIMINARY NOTICE

The next meeting of the American Dental Hygienists Association will be held in conjunction with the American Dental Association, Philadelphia, Pa., Aug. 23-28, 1926.

LEONA M. MITCHELL, *Secretary*,
State Department of Health,
Harrisburg, Pa.

DENTAL HYGIENISTS ASSOCIATION OF THE STATE OF NEW YORK

The Dental Hygienists Association of the State of New York will hold its sixth annual meeting at Hotel Astor, New York City, May 20-22, 1926. Clinics will be given, May 20-21, from 9 a. m. until 12 m.; literary meetings from 2 to 5 p. m. A business meeting will be held, May 22. A cordial invitation is extended to all ethical dentists and hygienists to attend the sessions and clinics.

CHRISTINE REDEFER, *President*,
18 E. 41st St., New York City.
HELEN R. DONEHUE, *Secretary*,
Bloomingdale Hospital,
White Plains, N. Y.

AMERICAN DENTAL GOLF ASSOCIATION

The seventh annual tournament of the American Dental Golf Association will be held in Philadelphia, Pa., during the week of Aug. 23, 1926.

THOMAS P. HINMAN, *Secretary*,
4th Nat. Bank Bldg.,
Atlanta, Ga.

HOMECOMING OF LOYOLA UNIVERSITY DENTAL DEPARTMENT

The forty-third annual Homecoming and Clinic of the Alumni Association of the Chicago College of Dental Surgery, Dental Department of the Loyola University will be held at the college, Monday and Tuesday, April 12 and 13, 1926.

The classes of 1886, Theodore F. Molt, chairman; 1896, William H. G. Logan, chairman; 1891, Donald McKay Gallie, chairman, and 1901, Fred F. Molt, chairman, will be the honored guests of the association at the banquet on Monday evening, April 12.

A splendid program has been prepared for this clinic and a cordial welcome is extended to all ethical dentists.

LESTER F. CLOW, *Chairman*,
Publicity Committee,
25 E. Washington St.,
Chicago, Ill.

MOUTH HYGIENE CAMPAIGN OF ESSEX COUNTY, N. J.

All of the dental societies of Newark and vicinity—Central Dental Association, Clinical Club and Newark Dental Club—are planning a mouth hygiene campaign for the last week in April (24-29.) This campaign is educational in character and addresses itself to the laity entirely.

We have hired an entire floor in the Y. W. C. A. in Newark for that week and will have an auditorium devoted to lectures and dental plays, and the rest of the floor for manufacturers' exhibits as well as educational exhibits, consisting of posters, models and charts.

The lecturers so far arranged for are Willis A, Sutton, superintendent of schools of Atlanta, Ga., J. Oppie McCall, New York, and E. V. McCollum, Baltimore. Each lecture will occupy the entire program for one evening, for about an hour, and will be supplemented by a movie or play or an open discussion.

Among the active features in preparation for our campaign will be a contest among high school students for the submission of a poster design for which we are offering $100 cash in prizes. About 2,000 posters with the prize design will be distributed throughout Newark and surrounding towns. For four weeks prior to the active campaign, we will offer prizes in an essay contest on mouth hygiene among school children.

We will also have prizes offered for the prettiest teeth in Essex County, the best teeth among high school boys and girls and the best teeth in persons over 60 years of age. Each of the four newspapers in Newark is going to feature one of our contests as its own. We have hired a trained newspaper man as our publicity agent.

A few days before the date of the beginning of our campaign week, we will distribute a vast number of dodgers announcing our campaign through the courtesy of such industrial agencies as insurance company agents and paying tellers of large industrial plants.

Every dentist in Worth Jersey will receive a pad of 100 invitations which he will be asked to address personally, sign and mail to his own patients, endorsing the campaign and inviting them to meet him personally at the exhibits.

We take this opportunity of extending an invitation to all dentists to become acquainted with our work, to come to our program and exhibits and to urge their patients to visit us as well.

A. WOLFSON, *Chairman.*

RESOLUTIONS ON THE DEATH OF KASSON CHURCH GIBSON

The following resolution was adopted by the First District Dental Society of the State of New York on the death of Dr. Kasson Church Gibson.

WHEREAS, death has again visited us and has taken from amidst our membership our friend and life member, Dr. Kasson Church Gibson, Dec. 26, 1925, and with the passing of Dr. Gibson we lose the last commanding figure of that group of men who were among the pioneers of our Society prior to 1880; and

WHEREAS, with his death the profession at large has lost one of its earnest advocates and a member who with unfailing integrity has represented during his long professional life, of over fifty-five years, the highest qualities as a sound and progressive practitioner, therefore be it

Resolved, that the First District Dental Society of the State of New York extend its sincere sympathy to Mrs. Gibson in her bereavement, which is the bereavement of the whole profession, and express its high regard for the work and character of this pioneer, who so ably exemplified the highest ideals of American dentistry; and be it further

Resolved, that a copy of these resolutions be spread on the minutes, inserted in the bulletin and sent to the members of his family and to the dental journals for publication.

Dr. Kasson Church Gibson was born in New South Berlin, New York, Sept. 21, 1849. At the age of 14, he left the house of his father, Stanford J. Gibson, a practitioner of medicine for over sixty years, and began to study in the office of Dr. Summer of Norwich, N. J. In 1875, he came to New York and entered the office of Dr. Norman W. Kingsley, with whom he remained for five years, at the same time studying at the New York College of Dentistry. Upon leaving Dr. Kinglsey, Dr. Gibson began to practice for himself. He remained in active practice until the day of his death, a period of over fifty-five years.

He joined the First District Dental Society about 1875. While with Dr. Kingsley, Dr. Gibson became interested in various institutions and devoted part of his day to their

various needs, giving freely of his time and experience. He was special lecturer for a great many years at the Baltimore College of Dentistry on Fractures on the jaw, cleft palate and oral surgery." He was associated with Drs. Joseph D. Bryant, Erdman and Keen at the operation of President Cleveland, making the obturator that again permitted the President to speak in public.

He was a member of various dental societies, a Past Grand Master of Merchant Lodge, F. & A. M., and a member of the National Guard of New York, serving for over fifty years as a member of the Sixth Company of the Seventh Regiment. He also served on the Colonel's Staff as Inspector of rifle practice and as Quartermaster of the Ninth.

B. W. WEINBERGER, *Chairman*,
Necrology Committee.

RESOLUTIONS ON THE DEATH OF EDWARD S. GAYLORD

The following resolution was adopted by the First District Dental Society of the State of New York on the death of Dr. Edward S. Gaylord.

WHEREAS, the First District Dental Society of the State of New York learns with sorrow of the decease of Dr. Edward S. Gaylord, an honorary member who has frequently given his services in various ways to the Society;

WHEREAS, these faithful, conscientious and unremitting labors are deeply appreciated and will be long remembered by his associates in this society, and

WHEREAS, we deem his removal a loss, not only to ourselves, but to the whole profession of the Country and all the civilized world, be it

Resolved, that the foregoing be placed on our records and that a copy be sent to his bereaved family and to the dental journals.

CLARENCE J. GRIEVES LIBRARY FOUNDATION OF THE MARYLAND STATE DENTAL ASSOCIATION

The Maryland State Dental Association has completed plans to honor Dr. Clarence J. Grieves by the establishment of a dental library to be known as the Clarence J. Grieves Library Foundation of the Maryland State Dental Association. An endowment has been established that will provide for a perpetual increase in the number of volumes, and a most attractive book plate has been especially designed by a well known Baltimore artist and markers from this plate will be inserted in each book placed in the library. Through a mutual agreement, the library will be placed as a separate unit in the library of the University of Maryland. The formal announcement of the foundation and the acceptance of the honor by Dr. Grieves will take place at a banquet to be held on May 4, 1926, during the annual meeting of the Maryland State Dental Association.

Already many donations of dental books have been made to the library, and the board of trustees extends an invitation to Dr. Grieves' friends to contribute books or journals if they so desire. Dr. Grieves has always been interested in dental literature and dental research, and he has made so many contributions to both that this seems a most appropriate tribute.

NORVAL H. MCDONALD, *Secretary.*
Board of Trustees of the Clarence J. Grieves Library Foundation:
GEORGE E. HARDY, *Chairman*,
HARRY E. KELSEY,
HORACE M. DAVIS,
ALEX. H. PATERSON,
NORVAL MCDONALD, *Secretary*.

BOOK REVIEW

Eiweissüberfütterung und Basenunterernährung. By Hofrat Dr. med. Carl Röse, Gebesee, Thuringia, Germany. 8vo, pp. 72. Emil Pahl, publisher, Dresden, Germany. Price, paper-covered 2.25 marks; bound, 2.75 marks.

The author is well known as an advocate of dietetics as influencing the calcification of the teeth. The title of this booklet is "Excessive Diet of Albumin and Inadequate Diet of Basic Mineral Salts." He is of the opinion that the present dietary of the white race has a tendency to extinguish the race. This is due to the consumption of an excess of albumin and a lack of food containing the mineral salts. He has proved this by experiments conducted on himself and others. The booklet is very thorough and of interest to any one making research along dietary lines.

SEVENTH INTERNATIONAL DENTAL CONGRESS

There will be available for advanced registration of the delegates to the International Dental Congress in Philadelphia during the week of August 23 to 28, 1926, hotel accommodations as follows:

Hotel	Capacity, persons	Rate per room per day
BELLEVUE-STRATFORD, S. W. Cor. Broad and Walnut Sts.	800 to 1000	$4.00 to $8.00
RITZ-CARLTON, S. E. Cor. Broad and Walnut Sts.	150	7.50
WALTON, Broad and Locust Sts.	400	4.00 to 6.00
STENTON, Broad and Spruce Sts.	50	5.00
THE SPRUCE, 13th and Spruce Sts.	200	4.00 to 6.00
SYLVANIA, Locust and Juniper Sts.	400 to 500	5.00 to 6.00
VENDIG, 13th and Filbert Sts.	300	3.50 to 4.00
WINDSOR, 1219-29 Filbert St.	200 to 300	4.00 to 5.00
HANOVER, N. W. Cor. 12th and Arch Sts.	200 to 300	4.00 to 5.00
ADELPHIA, 13th and Chestnut Sts. (*all rooms with bath*)	600	4.00 to 5.00
ST. JAMES, 13th and Walnut Sts.	300 to 400	4.00
ALDINE, 19th and Chestnut Sts.	100	4.00 to 5.00
ELK CLUB, Broad and Wood Sts. (*Men only*)	100	4.00
LORRAINE, Broad St. and Fairmount Ave.	250	3.00 to 6.00
MAJESTIC, Broad St. and Girard Ave.	200	3.00 to 6.00
PENNSYLVANIA, 39th and Chestnut Sts.	400	2.50 to 3.00
GREEN HILL FARMS, City Line and Lancaster Pike	40 to 50	5.00 to 6.00
BARTRAM, 33rd and Chestnut Sts.	250	3.00
ROBERT MORRIS, 17th and Arch Sts.	250	3.50 to 4.00
BELGRAVIA, 1801 Chestnut St.	70	3.50 to 9.00
CLINTON APTS., 10th St., below Spruce St.	100	4.00 to 5.00
STRATHMORE, 12th and Walnut Sts.	90	2.50 to 3.00
MARLYN APTS., 40th and Walnut Sts.	20	4.00 to 5.00
WASHINGTON, 7th and Dauphin Sts.	300	3.50
PENN ATHLETIC CLUB, 18th St. and Rittenhouse Square (*Men only*)	150	3.50 to 4.50
GIRARD CRAFTSMEN CLUB, 2027 Chestnut St. (*Men only*)	25	5.00 to 9.00
Y. M. C. A., 1425 Arch St. (*Men only*)	50 to 100	1.50 to 2.50
Y. W. C. A., 18th and Arch Sts. (*Women only*)	25	1.00 to 1.50
WALT WHITMAN, Broadway and Cooper St., Camden, N.J.	100	3.50 to 4.00
PHILADELPHIA YOUNG FRIENDS' ASSOCIATION, INC. Fifteenth and Cherry Sts.	20	4.00 to 4.50

Apartments

The following apartment houses have accommodation for a limited number at prices ranging from $10 to $20 per person per week.

3935 Baltimore Ave., C. Cox.
4218 Baltimore Ave., E. Esnard.
3331 Chestnut St., J. J. Boyle.
3338 Chestnut St., E. Krakow. Apartments for women.
4526 Sansom St., J. H. Newkirk.
3706 Spruce St., C. B. Marriott.
4818 Trinity Place, F. M. Millbourne.
3805 Walnut St., E. N. Simpson.
4311 Walnut St., P. A. Cortsen.
5126 Walnut St., J. B. McMillan.
5239 Walton Ave., M. E. Bussom.
108 S. 36th St., F. M. Katar.
330 S. 42nd St., M. C. Lowrie.
323 S. 46th St., H. V. Bechtold.
906 S. 46th St., D. Mackenzie.
1005 S. 49th St., F. Buckley.

Because of the many conventions coming to Philadelphia this same week, it is most desirable and necessary to reserve rooms *at once*. Requests for reservations should be directed to the hotel, apartment house or club. This is absolutely insisted on on account of the allotment of space which they have furnished to the Committee on Hotels for the Congress. Do not delay! It is suggested by the Hotel Association that whenever and wherever possible more than two occupy a room on account of the great demand for space during the Sesquicentennial period.

W. C. T. BAUERLE, *Chairman*,
Local Committee on Hotels,
Flanders Bldg., Philadelphia, Pa.

MAIL THIS APPLICATION DIRECT TO HOTEL

HOTEL RESERVATION

Seventh International Dental Congress, Philadelphia, Pa., August 23 to 28, 1926

..... Hotel. 1926

Philadelphia, Pa.

Please reserve accommodations noted below, beginning August .....

to August .....

..... Room (s) with bath for ..... people. Rate desired $ .....
(per day)

..... Room (s) without bath for ..... people. Rate desired $ .....
(per day)

List names and addresses of all who will occupy the room with you.

Name ..... Address .....
Street, City and State.

Name ..... Address .....
Street, City and State.

Name ..... Address .....
Street, City and State.

Name .....

Street .....

City ..... State .....

Certain Knowledge Instills Confidence

By Ernest V. Madison

WE hold our present positions in the business field through confidence in our ability. If the time should ever come when this confidence would be lessened, our ensuing services would be given under disadvantageous conditions.

To forestall its possible depreciation, we can strengthen the knowledge on which executive ability always rests—the knowledge of economical operation; of meeting management emergencies; of pleasing the whims of trade; of buying the supplies and equipment necessary to our business, etc.

The advertising pages of THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION contain such knowledge. They constitute a compendium of reliable development in supplies, materials and equipment for the dental field. They are succinct and restricted to products for use in our field—easily absorbed information for the busy executive.

The continued reading of these advertisements can only bring us more of the knowledge requisite to the administration of business in our field, and thereby reinforce the confidence now placed in us by our employers, partners, stockholders and customers.